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ABSTRACT

The purpose of this study was to obtain descriptive information about the nation's public library connectivity, use, and costs related to the Internet. The study gathered data from a national sample of public libraries from the period between May and July 1997. Unlike the 1994 and 1996 students, the 1997 study drew a new library sample that differed in 3 significant ways: (1) is used a larger sample size; (3) it did not use the region strata, but rather a metropolitan status strata; and (3) it used redefined population of legal service area strata. The findings presented suggest that there are numerous strategies and approaches for providing Internet-based services and resources to the public; there are numerous models for designing and deploying information technologies to provide access and services; there are multiple approaches and a range of different costs associated with providing these services that depend on local, situational factors that are very difficult to generalize; and that the diversity of public library Internet connectivity configurations, services and costs will continue to increase as libraries strive to provide network-based services in a rapidly evolving policy and technology context. The study limited its attention to the following key areas: budget spent on Internet-related services, technology deployment, and social issues. The data reported contribute to the ongoing effort to address these issues and topics for the public library community as well as for a range of policy makers at the federal, state and local settings. (AEF)

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The 1997 National Survey

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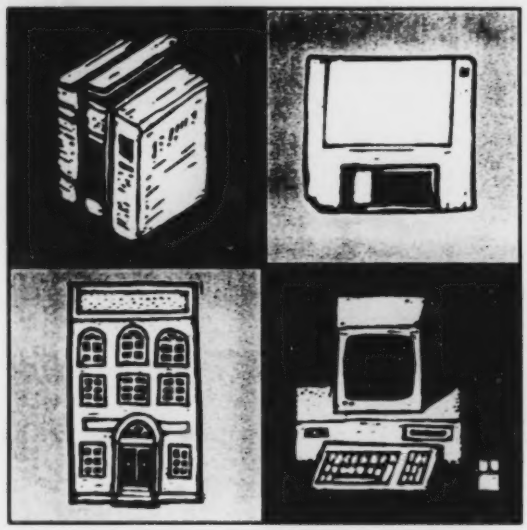

# of U.S. Public Libraries and the Internet

American Library Association Office for Information Technology Policy

A report on a survey conducted for the American Library Association by:
Dr. John Carlo Bertot, University of Maryland-Baltimore County
Dr. Charles R. McClure, Syracuse University
Dr. Patricia Diamond Fletcher, University of Maryland-Baltimore County

The survey was sponsored by the American Library Association Office for Information Technology Policy in cooperation with the U.S. National Commission on Libraries and Information Science and the American Library Association's Public Library Association and Office for Research and Statistics. Unless otherwise noted, information contained in this final report reflects results from *The 1997 National Survey of U.S. Public Libraries and the Internet* conducted from March through May 1997.

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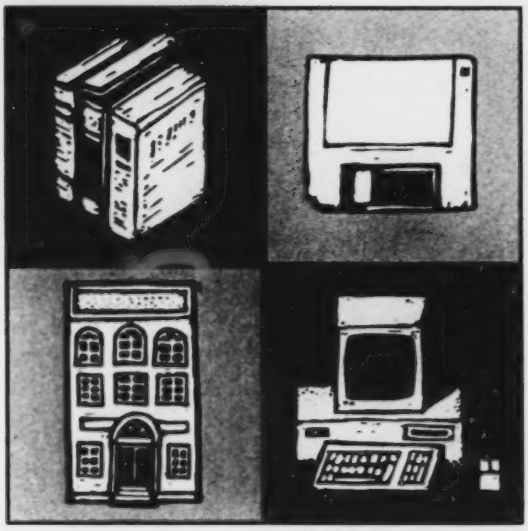
The 1997 National Survey



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PREFACE

We are pleased to present *The 1997 National Survey of U.S. Public Libraries and the Internet, Final Report,* the result of a project sponsored by the American Library Association (ALA), in cooperation with the U.S. National Commission on Libraries and Information Science (NCLIS).

For this year's survey ALA provided the major financial contribution and the oversight of its Office of Information Technology Policy. NCLIS also provided funding as well as its experience with this type of research, having sponsored similar surveys in 1994 and 1996.

Many people and organizations have already received and used the *Summary Results* booklet, produced in November 1997 to highlight survey findings. We are issuing this full report to provide the detail that many others require.

We acknowledge the professional stature and technical skills of Drs. John Carlo Bertot, Charles R. McClure, and Patricia Diamond Fletcher and commend their *Final Report.* It provides a wealth of information related to public libraries' connection to, use of, and costs associated with the Internet. It also raises questions, such as whether the level of connectivity in public libraries is sufficient for the population served.

The success of *The 1997 National Survey of U.S. Public Libraries and the Internet* is largely thanks to the high response from public librarians who participated. We look forward to continuing to explore these questions with and for the users of the information collected via these surveys of public libraries and the Internet.

Jeanne Hurley Simon
NCLIS Chairperson

Barbara J. Ford
ALA President

ACKNOWLEDGMENTS

The success of the 1997 national survey of public libraries and the Internet is due largely to the many public librarians who completed and returned the survey questionnaire. The high response rate to the survey indicates the continued interest on the part of the public library community in the use and development of the Internet. To those librarians that completed the questionnaires, we thank you very much.

We cannot stress enough our appreciation to the Federal State Cooperative System (FSCS) Data Coordinators in each of the various states, staff at the state library agencies, and state librarians. These individuals worked tirelessly to encourage libraries to respond to the questionnaire. They contacted library directors, reminded them to complete the survey, and oftentimes visited them directly to encourage them to reply. Were it not for their assistance, the study would not have had the high response rate it enjoyed. Thank you for your help.

The authors would also like to express our thanks to members of the Advisory Board. These individuals provided guidance, suggestions, and participated in pre-testing the survey instrument. Advisory Board members included: Robert Carterette, Automated Systems Manager, Cleveland Public Library; Mary Lou Caskey, Assistant Director, Mid-York Library System, Utica, NY; Keith Curry Lance, Director, Library Research Service, Colorado Department of Education; Mary Jo Lynch, Director, Office for Research and Statistics, American Library Association; Linda Mielke, Director, Carroll County Public Library; Amy Owen, State Librarian, Utah State Library Division; and Eleanor Jo Rodger, President, Urban Libraries Council.

The support and encouragement of the Office for Information Technology Policy (OITP) of the American Library Association, the National Commission on Libraries and Information Science (NCLIS), and the Public Library Association to conduct this survey and to be able to compare its findings to the ones conducted in 1994 and 1996 was most appreciated. J. Andrew Magpantay, Director of OITP, and NCLIS Interim Director Jane Williams, provided significant assistance in organizing the study, suggestions and ideas for data collection and analysis, and worked with other organizations to involve them in the study. Their direct involvement and assistance contributed significantly to the completion of the project. In addition, we would like to thank NCLIS staff, particularly Kim Miller and

Barbara White-leather, for the excellent assistance in distributing the mail surveys.

We would also like to thank Roz Korb and Steven Kauffman from the National Center for Education Statistics (NCES) for their assistance in drawing the weighted sample for this study.

Also, we owe a tremendous amount of gratitude to Mary Lou Caskey, Assistant Director, Mid-York Library System; Sandra Cooper, State Librarian, North Carolina State Library; Amy Owen, State Librarian, Utah State Library Division; Ellen Sleeter, Division Head, Morris Automated Information network - MAIN, County of Morris, NJ; and Barbara Summers, Director of Automation, Martin Library, York, PA, for their assistance in developing the public library Internet cost model worksheet and data contained in Appendix A.

We would like to thank Jonathan Lazar, research associate to this project, for his invaluable assistance and support throughout the project. His energy, enthusiasm, and research abilities served to boost the survey's response rate and coordinate various study activities.

Finally, the authors wish to thank Donald F. Norris, Linda Brown, and Debbie Meehan of the Maryland Institute for Policy Analysis and Research for their assistance in the administration of the grant at the University of Maryland Baltimore County.

John Carlo Bertot
Charles R. McClure
Patricia Diamond Fletcher

December 1997

CONTENTS

INTRODUCTION 1

STUDY PURPOSE AND KEY RESEARCH TOPICS 1

THE FEDERAL POLICY ENVIRONMENT 2
- The Telecommunications Act of 1996 2
- The Library Services and Technology Act 4
- The Government Performance and Results Act 4
- Restructuring of the Government Printing Office 5
- Overview 5

MOVING BEYOND CONNECTIVITY 5

STUDY RESULTS 7
- Methodology 7
  - Survey Instrument Development 7
  - Survey Procedures 7
  - Sampling and Data Analysis Procedures 8
  - Longitudinal Comparisons 10
  - Quality of Data 11
- Some Public Library Demographics 11
- Accessing the Internet 11
  - Factors Affecting Public Library Involvement with the Internet 11
- The Current State of Public Library Internet Connectivity 16
  - Percentage of Public Libraries Connected to the Internet and Population Served 16
- Type of Internet Connection, Connection Costs, and Connection Ratings 19
  - Dial-Up and Leased-Line Connections 20
  - Public Library Connection Ratings 28
- Internet Public Library Uses and Public Access Services 29
  - Public Library Provision of Public Access Internet Services 30
  - Remote/Dial-In Public Access Services 43
  - Public Access and Staff Workstations/Terminals 43
  - Public Library World-Wide Web Servers 43
  - Public Library Ratings of Public Access and Staff Workstations 44
- Public Library Information Technology Costs, Internet Service Costs, and Future Library Connection Resource Allocation 48
  - Public Library IT and Internet Costs 48
  - Anticipated Public Library Internet Costs 60
  - Internet Costs Not Paid by Libraries 61

SUMMARY 63

REPORT REFERENCES 65

APPENDIX A - INTERNET COST MODELS FOR PUBLIC LIBRARY NETWORKS 66
- INTRODUCTION 66
- METHODOLOGY 67
  - Research Questions 67
  - Preliminary Cost Model 67
  - Data Collection 68

Case Study Participants 69
Data Analysis 69
STATE AND REGIONAL PUBLIC LIBRARY NETWORK COST WORKSHEETS 70
The Cost Worksheet 70
Most Difficult Issues 71
Time to Complete the Worksheet 72
Cost Worksheet Modifications 72
Annual Cost Data 73
Summary of Cost Model Issues 73
STATE AND REGIONAL PUBLIC LIBRARY NETWORK INTERNET CONFIGURATIONS AND SERVICES 75
Regional Public Library Networks 76
Statewide Public Library Networks 76
SUMMARY 77
Key Issues 77
COST MODEL BIBLIOGRAPHY 79
APPENDIX A.1 - NETWORK PARTICIPANT LETTER 80
APPENDIX A.2 - COST WORKSHEET GLOSSARY 82
APPENDIX A.3 - COST WORKSHEET 85

APPENDIX B - 1997 INTERNET SURVEY INSTRUMENT AND LETTERS 90

APPENDIX C - FSCS PUBLIC LIBRARY UNIVERSE FILE ISSUES 97

APPENDIX D - FSCS DATA COORDINATORS AS OF JUNE 1997 98

ABOUT THE AUTHORS 100

THE 1997 NATIONAL SURVEY OF U.S. PUBLIC LIBRARIES AND THE INTERNET: SUMMARY RESULTS, NOVEMBER 1997 101

FIGURES

Figure 1. Survey Response Rate 9
Figure 2. Number of Public Libraries by Population of Legal Service Area and Metropolitan Status Code 10
Figure 3. 1994-1996 Longitudinal Data 11
Figure 4. Library FTEs and Operating Expenditures by Population of Legal Service Area and Metropolitan Status Code 12
Figure 5. Factors Affecting Library Internet Connectivity by Population of Legal Service Area and Urban/Rural Status for Non-Connected Libraries 13
Figure 6. Factors Affecting Library Internet Connectivity by Population of Legal Service Area and Urban/Rural Status for Connected Libraries 14
Figure 7. 1996-1997 Public Library Internet Connectivity and Average Months by Population of Legal Service Area and Urban/Rural Status 15
Figure 8. Public Libraries Planning to Connect to the Internet in the Next 12 Months by Population of Legal Service Area and Urban/Rural Status 17
Figure 9. 1994-1997 Connectivity and Projected Public Library Connectivity 18
Figure 10. U.S. Population Served by Public Libraries Connected to the Internet 19
Figure 11. Connected Public Libraries with Dial-Up, Leased-Line, and Both Dial-Up and Leased-Line Connections by Population of Legal Service Area and Urban/Rural Status 20
Figure 12. Libraries with No Dial-Up or Leased-Line Connections by Population of Legal Service Area and Urban/Rural Status 21
Figure 13. Public Library Type of Dial-Up Internet Connection by Population of Legal Service Area and Urban/Rural Status 22
Figure 14. Maximum Speed of Public Library Dial-Up Connection by Population of Legal Service Area and Urban/Rural Status 23
Figure 15. Average Number of Dial-Up Lines by Population of Legal Service Area and Urban/Rural Status ... 24
Figure 16. Average Cost of Dial-Up Lines by Population of Legal Service Area and Urban/Rural Status 25
Figure 17. Public Library Type and Maximum Speed of Leased-Line Connection by Population of Legal Service Area and Urban/Rural Status 26
Figure 18. Average Number of Leased-Lines by Population of Legal Service Area and Urban/Rural Status 27
Figure 19. Average Cost of Leased-Lines by Population of Legal Service Area and Urban/Rural Status 28
Figure 20. Library Adequacy of Internet Connection by Population of Legal Service Area and Urban/Rural Status 29
Figure 21. Public Library System Branches by Population of Legal Service Area 30
Figure 22. Public Libraries Providing Public Access by Population of Legal Service Area and Urban/Rural Status 31
Figure 23. Public Libraries Providing Public Access E-mail Internet Services by Population of Legal Service Area and Urban/Rural Status 32
Figure 24. Public Libraries Providing Public Access Newsgroup Internet Services by Population of Legal Service Area and Urban/Rural Status 33
Figure 25. Public Libraries Providing Public Access FTP Internet Services by Population of Legal Service Area and Urban/Rural Status 34
Figure 26. Public Libraries Providing Public Access Text-based World-Wide Web Internet Services by Population of Legal Service Area and Urban/Rural Status 35
Figure 27. Public Libraries Providing Public Access Graphical World-Wide Web Internet Services by Population of Legal Service Area and Urban/Rural Status 36
Figure 28. Public Libraries Providing Public Access Online Database Services by Population of Legal Service Area and Urban/Rural Status 37
Figure 29. Public Libraries Providing Public Access Online CD Services by Population of Legal Service Area and Urban/Rural Status 38
Figure 30. Public Libraries Providing Public Access Online Reference Services by Population of Legal Service Area and Urban/Rural Status 39

Figure 31. Public Libraries Providing Public Access to Special Software/Hardware for Individuals with Disabilities by Population of Legal Service Area and Urban/Rural Status 40
Figure 32. Remote/Dial-In Public Access Services by Population of Legal Service Area and Urban/Rural Status 42
Figure 33. Type of Public Access and Librarian Terminals by Population of Legal Service Area and Urban/Rural Status 44
Figure 34. Number of Library System Public Access and Librarian Terminals by Population of Legal Service Area and Urban/Rural Status 45
Figure 35. Percentage of Libraries that have Web Servers by Population of Legal Service Area and Urban/Rural Status 46
Figure 36. Public Library Ratings of Public Access Technology by Population of Legal Service Area and Urban/Rural Status 47
Figure 37. Total Average IT Expenditures and Internet Expenditures for the Last Completed Fiscal Year by Population of Legal Service Area and Urban/Rural Status 49
Figure 38. Internet Cost Data by Category as a Percentage of Overall IT Expenditures by by Population of Legal Service Area and Urban/Rural Status 50
Figure 39. Anticipated Internet Expenditures for Hardware Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 51
Figure 40. Anticipated Internet Expenditures for Software Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 52
Figure 41. Anticipated Internet Expenditures for Communications Hardware Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 53
Figure 42. Anticipated Internet Expenditures for Telecommunications Fees for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 54
Figure 43. Anticipated Internet Expenditures for Facilities Upgrade Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 55
Figure 44. Anticipated Internet Expenditures for Training and Education Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 56
Figure 45. Anticipated Internet Expenditures for Content and Resource Development Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 57
Figure 46. Anticipated Internet Expenditures for Program Planning and Management Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 58
Figure 47. Anticipated Internet Expenditures for Staffing Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 59
Figure 48. Anticipated Internet Expenditures for Maintenance Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status 60
Figure 49. Percentage of Internet Costs Not Paid by Libraries by Population of Legal Service Area and Urban/Rural Status 62
Figure 50. Average Internet Costs Not Paid by Libraries by Population of Legal Service Area and Urban/Rural Status 63

INTRODUCTION

Public libraries have made remarkable progress in connecting to the Internet. The first national study conducted in 1994 (McClure, Bertot, and Zweizig, 1994) found that 20.9% of public libraries in the United States had some type of connection to the Internet. The 1996 study (Bertot, McClure, and Zweizig, 1996) found that 44.4% of public libraries had a connection to the Internet. And the 1997 data reported here found that 72.3% of public libraries have an Internet connection. This is a significant effort on the part of the nation's public libraries to participate in the evolving global networked environment. [Note: This study collected data from public library *systems*, not *branches*. The state of public library connectivity at the branch level is unknown. According to the National Center for Education Statistics (1997), there are 8,921 public library systems in the U.S. Of these systems, 1,454 (16.3%) had branches (see Figure 21 later in this report).]

The 1996 national study showed that although public library Internet connectivity is increasing, there is a great deal of variation in the public library's type of Internet connection, technology infrastructure, and the provision of public access services by library population of legal service area and region (Bertot, McClure, and Zweizig, 1996). The variation in connectivity continues from data reported in the 1997 survey. In addition, these differences in connectivity raise a number of important issues related to public access and universal service that will require careful assessment and discussion.

Clearly there is a rapidly changing environment for public libraries. The findings presented later in this study show increased sophistication in public libraries' use of the Internet. They show significant amounts of resources being redeployed by public libraries to establish and maintain an information infrastructure to support the use of the Internet and other information technologies. Findings also suggest that defining and computing Internet-related costs for public libraries are quite complicated and will require additional research (see Appendix A).

Policy initiatives at the federal level also continue to affect the public library's transition into the networked environment. In addition, state networks continue to evolve that support a range of public library networked services (Bertot and McClure, 1996b; McClure and Bertot, 1997a). At the local level, a range of collaborative strategies appear to be developing to provide public access to the Internet through public libraries.

This report provides a wealth of information related to public libraries' connection to, use of, and costs associated with the Internet. The findings presented later in this report suggest that there are numerous strategies and approaches for providing Internet-based services and resources to the public; there are numerous models for designing and deploying information technologies to provide access and services; there are multiple approaches and a range of different costs associated with providing these services that depend on local, situational factors that are very difficult to generalize; and that the diversity of public library Internet connectivity configurations, services, and costs will continue to increase as libraries strive to provide network-based services in a rapidly evolving policy and technology context. The American Library Association has published an Executive Summary of results from this study that can be used to inform local communities of key findings and issues (American Library Association, 1997).

Public libraries are making significant and widespread advances to both connect to the Internet and provide a range of networked-based services and resources to their communities. But smaller and rural libraries have not been able to keep pace with their larger urban and suburban cousins. Moreover, the ability of some communities to support an adequate information infrastructure to provide the public with sophisticated networked-services also varies considerably. Indeed, as of this survey, only 9.2% of public library systems provide graphical Web public access services at the main/central library and all branches (see Figure 27 later in this report). Public libraries will continue to be challenged to provide high-quality access and services to the networked environment.

STUDY PURPOSE AND KEY RESEARCH TOPICS

Overall, the purpose of this study was to obtain descriptive information about the nation's public library connectivity, use, and costs related to the Internet. As suggested below, there are large areas where detailed information related to public libraries' connections, uses, and costs are essential for both policy makers and

for improved planning at the local library level. Thus, this study had to limit its attention to the following key areas:

- Budget spent on Internet-related services over time in such areas as
  - communications, system, software, training, content, and planning
  - infrastructure enhancements (technology and physical) to engage in Internet services;

- Technology deployment
  - information technology (IT) infrastructure (e.g., multi-media workstations, telecommunications services) to provide Internet-related services
  - unique library electronic resource development and service provision (e.g., Web servers); and

- Social issues
  - percentage of connected public libraries that serve rural/urban areas.

Such data can provide policy makers, various stakeholder groups, and the library community with the ability to study the relationships between public library Internet-related costs, services, IT infrastructure, and types of populations served for public library electronic networked services. The data reported here contribute to the ongoing effort to address these issues and topics for the public library community as well as for a range of policy makers at the federal, state, and local settings.

Efforts are, however, underway to better describe public libraries' connections, uses, costs, and services (especially in economically defined geographic areas) related to the Internet. Data reported here is one first step. Ongoing efforts by the National Center for Educational Statistics (NCES) and the National Commission on Libraries and Information Science (NCLIS), and state library agencies, through the Federal State Cooperative System (FSCS), are attempting to incorporate public library data collection in their national surveys. The Office for Information Technology Policy (OITP) of the American Library Association (ALA) is working with the Florida State University to better describe public library outlets in terms of the poverty level of the community they serve. And most recently, the Gates Library Foundation has indicated an interest in working with public libraries to improve their Internet use and services provision <http://www.glf.org/>. OITP's home page <http://www.ala.org/oitp/> describes other efforts as well.

THE FEDERAL POLICY ENVIRONMENT

The Federal policy environment is continually evolving and requires policy makers, stakeholder groups, and library professionals to make decisions that can affect the ability of public libraries to transition to and actively participate in the developing National Information Infrastructure (NII). Space does not permit a detailed review of those policy initiatives, but the following are especially important.

The Telecommunications Act of 1996

The Telecommunications Act of 1996 (P.L. 104-104) (TCA) was the first significant legislative overhaul to the Communications Act of 1934. The TCA essentially updated a variety of key aspects of the telecommunications industry, creating a more market-driven industry that relied on competition to foster lower telecommunications rates throughout the nation (Mueller, 1997).

The universal service provision of the TCA specifically directed the Federal Communications Commission (FCC) to create a discount structure for telecommunications services for schools, libraries, and rural health care institutions (P.L. 104-104, Section 254). Based on the broad guidelines established by the TCA, the FCC issued its final universal service rulemaking on May 7, 1997. In this ruling, the FCC created a (FCC, 1997, Section X):

- $2.25 billion annual discount fund for schools and libraries; and

- Telecommunications discount structure ranging from 20%-90% for telecommunications services (defined as telecommunications conduits--e.g., leased-lines, internal wiring, and Internet connectivity). The discount rate a school or library can receive depends on the percentage of students on school lunch programs and the location (urban/rural) of the school or library.

The universal service provisions of the TCA, and the FCC implementation of those provisions, are aimed

specifically at increasing connectivity of schools and libraries to the Internet.

The TCA (P.L. 104-104) has the promise of both introducing competition in the telecommunications industry as well as providing preferential rates for public libraries, schools, and health care institutions. But, a key issue in this National policy context is that of Universal Service.[1] The goal of public libraries to provide universal service to the public for access to the Internet is one that has received much attention and discussion during recent years. But as this discussion and policy debate continues, there is little agreement on what constitutes "universal service" and what types of "services" constitute basic and advanced services. What is known, however, is that connectivity to the Internet alone is *not* the provision of networked services (e.g., Web-based resources). Thus, policy makers should not confuse public library Internet connectivity with the degree to which public libraries provide networked-based services.

The FCC is in the process of developing rules to implement the universal service provisions mandated in the *Telecommunications Act of 1996* (P.L. 104-104, Section 254). Libraries and schools may receive special attention to promote affordable access to the Internet and the availability to Internet services. Section 254b offers the following principles to advance universal service:

- **Quality and rates**: Quality services should be available at just, reasonable, and affordable rates.

- **Access to advanced services**: Access to advanced telecommunications and information services should be provided to all regions of the Nation.

- **Access in rural and high cost areas**: Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services . . . that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonable comparable to rates charged for similar services in urban areas.

- **Equitable and nondiscriminatory contributions**: All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service.

- **Access to advanced telecommunications services for schools, health care, and libraries**: Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services as described in subsection (h).

- **Additional principles**: Such other principles as the Joint Board and the Commission determine are necessary and appropriate for the protection of the public interest, convenience, and necessity and are consistent with this Act.

Later, in section (B) of the universal services provision, the law states "all telecommunications carriers serving a geographic area shall . . . provide such services to elementary schools, secondary schools, and libraries for educational purposes at rates less than the amounts charged for similar services to other parties."

Such language raises complicated issues. For example, the 1997 data provided in this report suggests that approximately 27.7% of public libraries that serve 9.2% of the population remain to be connected to the Internet as of May 1997 (see Figure 10).[2] The data also show that these public libraries have small communities, typically 5,000 or under, and oftentimes are located in rural areas. For a host of reasons, the costs to connect the last 27.7% of public libraries and

[1]For a detailed discussion of Universal Service definitions and concepts, see: Bertot, J.C., and McClure, C.R. (1996). The Clinton Administration and the National Information Infrastructure. In P. Hernon, C.R. McClure, & H. Relyea (Eds.), *Federal information policies in the 1990s: Issues and conflicts*. Norwood, NJ: Ablex Publishing Corporation, pp. 19-44. Also review related documents at the FCC website: <http://www.fcc.gov>.

[2]This study surveyed library systems. The extent and nature of branch connectivity is unknown.

the costs for those libraries to provide networked services, are likely to be significant. At what point is it possible to say that public libraries are providing "universal service" to the public? at a 75% connectivity rate? when 90% provide Web-based information resources and services?

As the FCC and the Joint Board develop rules to implement these and other universal services provisions, it is important to recognize that serious discrepancies already exist in the provision of Internet connectivity and services through public libraries. At issue are the:

(1) Mechanisms to provide universal service to schools and public libraries;

(2) Rates through which such services shall be offered; and

(3) Level of service, both in terms of connectivity and content, schools and public libraries shall have access to via the Internet/evolving National Information Infrastructure (NII).

The extent to which the TCA, for states, local communities, and the public library community can resolve these discrepancies has yet to be determined. Indeed, the FCC, through the Joint Board, issued recommendations that provide for a sliding scale of discounts for public libraries and schools ranging from 20 to 90 percent that is dependent on an institution's poverty rate as measured through the percentage of students on school lunch programs and its urban/rural status. The final distribution and awards of these discounts remain unclear as this report is written.

The Library Services and Technology Act

On September 30, 1996, the President signed into law the Library Services and Technology Act (P.L. 104-208) (LSTA). LSTA marked a change in the direction of federally-funded library initiatives over its predecessor the Library Services and Construction Act (LSCA) in several key ways:

- LSTA consolidates portions of the Higher Education Act that related to a variety of national level library needs;
- LSTA is now administered by the Institute for Museum and Library Services (IMLS);
- LSTA applies to nearly all types of libraries, not just public libraries;
- LSTA increases the emphasis on electronic networking activities; and
- LSTA requires states to evaluate and report on the impact of LSTA-funded initiatives.

Taken together, these key components of LSTA create a new federal-state-library funding environment that emphasizes collaboration, performance, and technological innovation.

As this report is being written, the IMLS has proposed draft guidelines for 1998 National Leadership Grants <http://www.ims.fed.us/guidelines/natlead.pdf>. There are subtle but important differences between the funding guidelines proposed by IMLS and those traditionally produced under the LSCA. Since funds made available through the National Leadership Grants will have an important impact as a catalyst to move public libraries (and other organizations) into the networked environment, the final version of these guidelines is an important policy issue.

The Government Performance and Results Act

Espousing the virtues and needs of effective and efficient government requires that citizens and federal government managers alike benchmark government services against some performance measure(s) and/or indicator(s). In a step towards developing such performance measures, the Congress passed the Government Performance and Results Act (P.L. 103-62) (GPRA). The GPRA stresses the need to improve federal program effectiveness and public accountability by promoting a new focus on results, service, and customer satisfaction.

Specifically, the GPRA requires federal agencies to establish program-based performance goals for agency program areas that are quantifiable, objective, and measurable. Agencies must also create perfor-mance indicators that can measure and/or assess the outputs, service levels, and outcomes of agency program activities.

The GPRA, therefore, requires each federal agency to have a clear mission that describes the purpose and function of the agency, develop set of outcome-oriented objectives that serve to attain the agency mission, and

develop a set of quantifiable performance indicators and measures that will assist program managers determine whether and the extent to which their programs achieve program objectives and support the agency mission.

GPRA has a substantial impact on the IMLS and, subsequently, LSTA. LSTA was created as a performance- and results-based initiative. There is likely to be continued emphasis on states receiving federal money to be able to demonstrate and measure specific outcomes from federally funded projects. Given this environment, the evaluation of public libraries and statewide networks receiving federal monies is likely to require a range of data that may not be currently available.

Restructuring of the Government Printing Office

There has been an ongoing effort to update Title 44 of the *U.S. Code* which provides the legislative basis for the operation of the Government Printing Office (GPO) and the Federal Depository Library Program (FDLP). Public libraries have long been a key point for citizens' access to government information through the FDLP, as well as directly to a range of agency information. During 1997 there has been a concerted effort to consider how best such a revision to Title 44 and restructuring of the GPO and FDLP could be accomplished. Indeed, as of December 1997 there is draft legislation being developed to effect such changes.

With increased use of Web sites by federal agencies to disseminate government information and provide a range of agency services, public libraries will need to take on increased responsibilities for providing access to that information and those services. As shown by the data in this report, while over 70% of public library systems are connected to the Internet, there is less information available as to the public libraries' ability to identify, access, disseminate, manipulate, and manage the huge expanse of Web-based and other electronic information resources.

Thus, the public library community will need to monitor closely the efforts to revise Title 44 of the *U.S. Code* and otherwise restructure the GPO and the FDLP. Indeed, as the policy issues within this area become clearer, the restructuring may provide public libraries with an excellent opportunity to better formalize their roles and responsibilities related to providing public access to federal government information.

Overview

The policy areas identified briefly above do not do justice to the range of policy initiatives currently being debated that affect public libraries and their role in the NII. For example, other topics currently being discussed include:

- Copyright and intellectual property rights;
- Encryption;
- Role of the National Telecommunications and Information Agency (NTIA) as a funding agency for NII initiatives;
- Censorship and First Amendment rights in the NII; and
- Privacy.

This list is illustrative only, and readers should note that many of this issues have international implications. Increasingly, the policy issues related to the development of the NII will have significant impact on libraries of all types--and especially public libraries. The data reported here, while not related directly to some of these policy areas do provide an important beginning point to develop a national database of public library information that can be used to debate these and other information policy issues. Such debates, and the need for national data related to those debates, will only continue in importance as they affect public library development.

MOVING BEYOND CONNECTIVITY

There is a great deal of electronic networking activity occurring in public library, statewide, and K-12 environments. These innovative and creative initiatives demonstrate what can happen when federal, state, and local governments, community-based stakeholder groups, and private sector organizations collaborate to create new means of working together, do more with less, and reduce the overlap of services. In doing so, network creators assume that such initiatives will provide better networked services and promote greater citizen prosperity, productivity, and education at all levels through the effective and efficient use of advanced networking technologies (Office of the Vice President, 1993; National Information Infrastructure Advisory Committee, 1995).

Many organizations in general, and public libraries in particular, have built significant networks and connected to the Internet as part of the evolving National Information Infrastructure (NII). As of spring 1997, 72.3% of public library systems have some type of Internet connection, as compared to 20.9% in 1994 (McClure, Bertot, and Zweizig, 1994). The overall public library level of Internet connectivity varies greatly, however, by the population public library systems serve, with 1997 data suggesting that public library systems in larger population areas having significantly higher (100% for libraries with population of legal service areas of greater than one million) rates of Internet connectivity than public library systems in smaller population areas (56.3% for libraries with population of legal service areas of less than 5,000). There is also a significant difference in public library system connectivity between urban (86.9% for central city libraries) and rural (66.0% for non central city libraries) libraries. Thus, public library Internet connectivity is not equal nor even throughout the nation. The degree to which the Joint Board of the FCC can help to alleviate these discrepancies with the Universal Service Fund (USF) remains to be seen.

The notion of universal service, however, implies some baseline or minimal level of Internet *services* to which the federal government assures the public it can access and use. For example, the government could assure the public that they are entitled to, minimally, professional assistance in how to use the information superhighway and obtain basic government services via the superhighway.

Existing policy definitions of universal service fail to differentiate between requirements for first providing access (connectivity), and then, determining what, if any, *services* should be made universally available. Furthermore, they often fail to recognize that providing access, say a 56kbps line to a local public library, may still not provide appropriate *services* from the public library if, in fact, that 56kbps line has 22 public access workstations on it. Furthermore, access to information *resources* is not provision of networked *services*. National goals related to "connectivity" alone may be short-sighted. NII goals to provide a range of government services (United States Advisory Council on the National Information Infrastructure, 1996) to the public will require better connectivity at public libraries than 28.8kbps modems.

As discussed elsewhere, (McClure and Bertot, 1997b) public libraries exist in a range of very different environments using multiple types of connections, receiving various types of state and local assistance and working in consortia, and serving communities that oftentimes vary considerably from library to library. In this context, the key issue now is less the degree to which the nation's public libraries are connected, but rather:

- The degree to which specific levels of connectivity (e.g., 28.8kbps versus a T1 leased-line) affect services development and the extent and types of Internet-based services that public libraries can provide given that connection;
- The extent to which public library Internet connectivity and Internet-based services meet community information needs;
- How public library information technology infrastructures are evolving, their costs, the degree to which these infrastructures integrate various electronic and networked services, and how these infrastructures are being funded; and
- The specific criteria necessary to assess when universal service to the public has been accomplished as per the *Telecommunications Act of 1996*.

Although information on connectivity, use, and costs -- as reported in this study--are important, policy makers and the public library community may need to reassess the types of national data that will be required in the future to continue the discussion of the role of public libraries in the NII and the evolving global networked environment.

The next section presents the 1997 study methodology and findings.

STUDY RESULTS

The study gathered data from a national sample of public libraries concerning the current level of public library involvement with the Internet. The data collection occurred between May and July 1997. The purpose of this study was to: (1) Provide policy makers, researchers, and library professionals with longitudinal data that measured changes in public library Internet involvement since the first and second *Public Library* Internet studies (Bertot, McClure, and Zweizig, 1996; McClure, Bertot, and Zweizig, 1994); (2) Identify costs for public library Internet services, and describe the relationship between costs and Internet service provision; (3) Establish baseline data for library telecommunications and public Internet access infrastructure; (4) Assist public libraries develop IT plans that incorporate electronic networked services, to include the means through which to apply for the universal service discounts; and (5) Identify public library roles and capabilities in the evolving NII.

Methodology

Unlike the 1994 and 1996 studies which used the same public library sample, the 1997 study drew a new library sample that differed in three significant ways:

(1) It used a larger sample size of 2,000 public library systems, rather than the sample of 1,500 in the previous studies;

(2) It did not use the region strata (Midwest, Northeast, South, or West), but rather a metropolitan status strata of CC=Central City (Urban), NC=Metropolitan Area, but not within central city limits (Suburban), NO=Not in a Metropolitan Area (Rural); and

(3) It used redefined population of legal service area strata of million+, 500,000-999,999, 100,000-499,999, 25,000-99,999, 5,000-24,999, and less than 5,000, rather than million +, 500,000-999,999, 250,000-499,999, 100,000-249,999, 50,000-99,999, 25,000-49,999, 10,000-24,999, 5,000-9,999, and less than 5,000.

The new sample does provide for comparative analysis of 1994, 1996, and 1997 data along the population of legal service area strata, with some adjustments. It also allows for overall findings comparisons. Where possible, therefore, the analysis provides longitudinal data.

Survey Instrument Development

The study team based the initial draft of the survey instrument on the form used in 1996, making modifications to reflect the current Internet technology and policy environment, Internet cost factors, and public library management issues. In addition, an Advisory Board for this study provided suggestions for topics to address concerning public library involvement with the Internet. The 1997 survey incorporated key questions from the 1994 and 1996 surveys to provide longitudinal data for 1994-1996 public library Internet involvement changes. In March 1997, the Advisory Board reviewed a draft of the survey instrument. The study team used the comments from the Board, OITP staff, and NCLIS staff to produce a second version of the survey instrument.

Board members each pretested the second draft of the survey instrument with at least five librarians of the type who would receive the final questionnaire. By April 7, 1997, the study team received 32 completed pretest instruments along with comments from the Board members. The study team finalized the survey instrument on April 14, 1997, and mailed out the final survey to participating public libraries during the first week of May 1997 with a request for response by May 23, 1997 (see Appendix B for a copy of the final survey instrument).

Survey Procedures

This study employed a number of techniques to increase the likelihood of prompt response from libraries:

- Sending a postcard via first-class mail to sampled libraries one week before the survey mailing to alert the library director that the survey would be coming. The postcard explained the importance of a prompt response and asked the library director to notify the survey office if a survey was not received as of May 7, 1997 (see Appendix B for a copy of the postcard);

- Sending each state FSCS Data Coordinator a survey packet that included a letter describing the survey to encourage study participation, a

copy of the survey, and a list of their respective state's sampled libraries prior to the mailing of the library survey;

- Sending a cover letter on ALA stationary and signed by both ALA president Mary Somerville and NCLIS chairperson Jeanne Hurley Simon along with the survey. The letter explained the purpose of the survey and stressed the importance of prompt response (see Appendix B for a copy of the letter);
- Providing notices in pertinent library and ALA, NCLIS, and PLA literature to announce the conduct of the survey;
- Mailing surveys via first-class mail with a first-class stamp affixed to the return envelope;
- Performing a second mailing of the survey in June 1997 to 500 selected non-responding libraries to increase the response rate within certain metropolitan status and population of legal service area strata;
- Faxing each state library agency with non-responding libraries a list that included the names of non-responding libraries in early June 1997. The fax asked for assistance in increasing the response rate. The FSCS State Data Coordinators proved especially helpful in increasing the survey's response rate;
- Staying in contact with and providing frequent study updates to FSCS State Data Coordinators through a listserv established specifically for Data Coordinators.
- Making the survey available on a Web site in Adobe PDF format so that those libraries with access to the Web could download a copy of the survey for completion;
- Returning respondent phone call and e-mail queries concerning survey questions and procedures; and
- Faxing and mailing additional copies of the survey to libraries requesting replacement surveys.

The cooperation of the state library agencies was instrumental in the ability of the researchers to obtain a high response rate in a matter of a few months. Indeed, many state librarians sent participating libraries separate letters requesting library participation in the study.

Sampling and Data Analysis Procedures

With assistance from NCES, the researchers drew a weighted sample of public library administrative units. The sample was selected from the Public Library Data 1994 Universe File of public libraries maintained by NCES (NCES, 1997). According to the Universe File, there are 8,921 public library systems in the United States.

Based on the above technique, a sample was drawn of 2,000 public library systems. A total of 1,426 surveys were returned, for a response rate of 71.3%.

In drawing the original sample, the public library Universe File was stratified by library legal service population class (the legal service population classes were as follows: million+, 500,000-999,999, 100,000-499,999, 25,000-99,999, 5,000-24,999, and less than 5,000) and, within legal service population class, by three metropolitan status codes (the metropolitan status groupings were as follows: CC=Central City [Urban], NC=Metropolitan Area, but not within central city limits [Suburban], NO=Not in a Metropolitan Area [Rural]). The sample was selected by NCES using a systematic probability proportional to size sampling procedure, the measure of size being the square root of library legal service area. (For more detailed information on the sampling technique used in this study and the drawing of the sample from the NCES Public Library Universe File, contact Steven Kaufman at NCES or John Bertot at the University of Maryland Baltimore County).

This sampling method assigns each sampled library a weight to reflect its contribution to the estimates for the population stratum to which it belongs. The sample included all larger libraries (those servings populations above 100,000), and thus those libraries each received a weight of one. Libraries

Figure 1. Survey Response Rate.

	Percentage in Population*	Percentage of Respondents
Million +	0.2%	0.2%
500,000-999,999	0.5%	0.5%
100,000-499,999	4.4%	4.5%
25,000-99,999	15.3%	15.7%
5,000-24,999	35.2%	35.3%
LT 5,000	44.3%	43.8%
Overall	**100.0%**	**100.0%**
Total Number of Respondents = 1,426		**Response Rate = 71.3%**
***Using 1994 public library percentages (NCES, 1997)**		

serving smaller communities received larger weights to the degree that the proportion of their stratum sampled was smaller. Furthermore, after determining the final response rate, adjustments were made to the weights within sampling strata to allow national estimates that compensated for non-responding libraries.

In order to produce a national estimate, it is necessary to adjust and sum the weights for the libraries that furnished a value. This provided a nationally estimated count of the libraries with that value. For example, to estimate the number of libraries with an Internet connection (question 4 on the 1997 survey), the adjusted weights of all responding libraries that indicated they had some type of an Internet connection were summed.[3] Percentages were then calculated in the conventional way.

Any estimates to be derived in the future from this data set will need to follow these same procedures of computing estimates from the weights. Direct calculations from the sample data will not produce correct estimates.

Because the weights were determined within the population and metropolitan status strata, it is possible to make estimates for the population and metropolitan status levels and through aggregation for the national level. Because of the sample size and the weighting procedure, estimates cannot be made for individual states or for other classes that might be of interest, such as consortia or library systems. The sample design was constructed in this manner in order to keep the sample

[3]An example, Concord Free Public Library Massachusetts, based on the FSCS Population of Legal Service Area (5,000-24,999) and Urban/Rural categories (Suburban, NC), has been assigned a weighting factor of 6.37 by NCES. In producing national public library estimates for public libraries in the same Population and Urban/Rural categories, each Concord Free Public Library variable response is multiplied by its assigned weight. Based on Concord's indication of an Internet connection, it is estimated that 6.37 other public libraries in the same strata have some type of an Internet connection. Totals for the strata are achieved through summing all the weights in the appropriate categories. Analysis for each public library and survey question must follow the above procedure to produce accurate national estimates.

Figure 2. Number of Public Libraries by Population of Legal Service Area and Metropolitan Status Code.

Population of Legal Service Area	Number of Libraries	Metropolitan Status Code	Number of Libraries
Million +	20	CC	537
500,000-999,999	49	NC	2,464
100,000-499,999	392	NO	5,623
25,000-99,999	1367	Unknown*	297
5,000-24,999	3143		
LT 5,000	3950		
Overall	**8,921**		**8,921**

***As discussed in Appendix C, it is not possible to determine the metropolitan status codes for all library systems primarily due to issues related to the definition of what constitutes a library's central entity.**

size as small as possible and to allow a rapid reporting of data in this dynamic research area. Producing estimates at the state level would require such a large sample size that it would approach the population of libraries and would lose the advantage of a quick response survey.

It is possible to infer the quality of the estimates from the sample quality achieved as shown in Figure 1 and from the close match between estimates of expenditures from this sample and population data reported by NCES (1997). However, readers should keep in mind that the quality of estimates is directly related to the numbers of libraries providing responses. In producing national estimates, the re-weighting of responding public library data compensates for non-responding public libraries. The questions skipped or left blank by responding public libraries, however, do affect the national estimates. Overall response within question response rates is not included, though, due to the weighted sample--one library response does not correspond to one library estimate--making the calculation of a within-question response rate impractical.

It is possible, however, to provide approximates of the number of public library systems in each of the strata (see Figure 2). Such estimates are more readily possible for the population of legal service area strata than the metropolitan status strata due to the nature of the Universe File and the File's classification of library administrative units (see Appendix C for a more detailed discussion of this issue). Indeed, due to the nature of the Universe File, it is not possible to determine the metropolitan status assignments for 297 public library systems.

Longitudinal Comparisons

To make direct comparisons between the 1996 and 1997 data, a set of key questions was asked in a similar and/or identical fashion (see Figure 3). Other questions are not comparable with 1994 or 1996 data because of modifications in the questions made to reflect changes in public library Internet involvement and technology.

Due to space and time considerations, this report does not present all possible 1994-1997 data

Figure 3. 1994-1997 Longitudinal Data.

1997 Question	Variable
Question 3	Library Operating Expenditures
Question 4	Current Connection to the Internet
Question 5	Plan to Connect to the Internet in the Next 12 Months
Question 6	Factors Affecting Current Level of Involvement with the Internet
Question 8	Type and Speed of Dial-up Connection
Question 9	Type and Speed of Leased Line Connection
Question 11	Type and Location of Public Access Internet Services
Question 12	Type and Number of Public Access/Library Staff Workstations
Question 16	Public Library Internet Connectivity Costs and Anticipated Costs

comparisons. Rather, the report depicts selected comparative data.

Readers should note that the survey collected data from library systems, not branches. While only 16.3% of library systems have branches (NCES, 1997), 75% of those that do serve population of legal service areas of greater than 25,000. Thus, a substantial portion of the U.S. population is served by library systems with branches. Internet connectivity at the branch level is unknown at this time.

Quality of Data

An analysis of respondents indicated no non-response bias. The survey results are representative of national demographics indicating excellent representation of the broader public library population (see Figures 1 and 4). As shown in Figure 4, public library operating expenditures and FTEs have increased since the most recent 1994 data provided by NCES.

Some Public Library Demographics

Public library expenditures and number of employees vary by both population of legal service area and metropolitan status. As library population of legal service area increases, so does the number of full-time equivalents (FTEs) and operating expenditures. The national average of FTEs is 19.3, with the average public library having operating expenditures last fiscal year of $632,948.19 (see Figure 4). These figures closely match those found by NCES (1997), providing additional verification of the quality of the data.

Figure 4 also clearly shows that, as library population of legal service area increases, so too does the average number of library FTEs and the average operating expenditures. Figure 4 indicates, however, that the distribution of public library operating expenditures, as well as the number of FTE staff, is not even across metropolitan areas. Operating expenditures for the last fiscal year and FTEs were greatest in urban (CC) libraries, followed by suburban (NC) libraries, and rural (NO) libraries.

Accessing the Internet

This section of the report presents findings concerning motivations and factors affecting public library involvement with the Internet.

Figure 4. Library FTEs and Operating Expenditures by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	1994 Average FTEs (NCES, 1997)	1997 Average FTEs	1994 Average Operating Expenditures (NCES, 1997)	1997 Average Operating Expenditures
Million +	467.8	499.9	$36,014,000.00	$37,504,848.85
500,000-999,999	232.6	235.2	$17,880,469.39	$18,075,655.88
100,000-499,999	77.0	78.3	$3,696,757.65	$3,953,779.09
25,000-99,999	21.4	22.1	$954,324.07	$1,055,997.92
5,000-24,999	5.9	5.8	$244,510.34	$251,302.28
LT 5,000	1.7	2.3	$35,816.96	$37,254.59
Overall	**12.6**	**19.3**	**$589,629.75**	**$632,948.19**

Urban/Rural Status				
	1994 Average FTEs (NCES, 1997)	1997 Average FTEs	1994 Average Operating Expenditures (NCES, 1997)	1997 Average Operating Expenditures
CC	N/A	66.9	N/A	$3,785,073.83
NC	N/A	16.7	N/A	$947,876.77
NO	N/A	5.1	N/A	$207,152.26
Overall	**N/A**	**19.3**	**N/A**	**$632,948.19**

Factors Affecting Public Library Involvement with the Internet

Several factors affect library involvement with the Internet for connected and non-connected public libraries. As Figure 5 indicates, non-connected public libraries consider all identified factors to be important in determining public library Internet involvement, with importance ratings ranging from 1.03 to 1.75 (1=very important, 5=very unimportant). Key factors affecting non-connected public library Internet involvement include telecommunications costs (1.03), followed by hardware/systems costs (1.08), the availability of state/federal money (1.16), and a tie between the availability of staff time to develop expertise on the Internet and Internet connection maintenance issues (1.9). In general, the data show

Figure 5. Factors Affecting Library Internet Connectivity by Population and Urban/Rural Status for Non-Connected Libraries.

Population of Legal Service Area																
	Hardware Costs	Software Costs	Communi-cations Hardware Costs	Telecom-muni-cations Fees	Training Costs	Content Costs	Facilities Up-grades	Staffing Costs	Internet Connection Maintenance	Access to Reliable Telecom Services	Availability of State/Other Telecom Services	Availability of In-House Computer Expertise	Availability of Staff Time to Develop Internet Expertise	Availability of Federal/ State Money	Digital Copyright Fees	Concerns Over Access to Objectionable Material
Million +	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
500,000-999,999	1.00	2.00	1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.00	2.00	1.00	1.00	1.00	1.00	2.00
100,000-499,999	1.95	2.16	1.95	1.04	2.07	2.43	2.20	1.96	2.46	1.02	2.38	1.22	1.04	2.12	1.45	1.32
25,000-99,999	1.51	1.81	1.75	1.02	1.95	1.84	1.74	1.61	1.44	1.29	1.73	1.29	1.11	1.52	2.00	1.55
5,000-24,999	1.52	1.81	1.69	1.30	2.00	2.20	1.86	1.81	1.71	1.76	2.05	1.63	1.40	1.48	2.17	1.94
LT 5,000	1.00	1.05	1.09	1.01	1.05	1.33	1.37	1.11	1.04	1.51	1.63	1.19	1.11	1.03	1.48	1.46
Overall	**1.08**	**1.30**	**1.29**	**1.03**	**1.36**	**1.60**	**1.53**	**1.33**	**1.19**	**1.56**	**1.75**	**1.32**	**1.19**	**1.16**	**1.69**	**1.59**

Urban/Rural Status																
	Hardware Costs	Software Costs	Communi-cations Hardware Costs	Telecom-muni-cations Fees	Training Costs	Content Costs	Facilities Up-grades	Staffing Costs	Internet Connection Maintenance	Access to Reliable Telecom Services	Availability of State/Other Telecom Services	Availability of In-House Computer Expertise	Availability of Staff Time to Develop Internet Expertise	Availability of Federal/ State Money	Digital Copyright Fees	Concerns Over Access to Objectionable Material
CC	1.17	1.21	1.18	1.02	1.11	1.88	1.30	1.47	1.13	1.06	1.53	1.12	1.01	1.27	1.66	1.00
NC	1.46	1.59	1.63	1.49	1.97	1.97	1.94	1.77	1.73	1.56	2.30	1.58	1.52	1.08	1.94	1.54
NO	1.00	1.24	1.22	1.00	1.23	1.50	1.44	1.22	1.07	1.37	1.64	1.26	1.12	1.17	1.63	1.63
Overall	**1.08**	**1.30**	**1.29**	**1.03**	**1.36**	**1.60**	**1.53**	**1.33**	**1.19**	**1.56**	**1.75**	**1.32**	**1.19**	**1.16**	**1.69**	**1.59**
1=Very Important 5=Very Unimportant																

Figure 6. Factors Affecting Library Internet Connectivity by Population and Urban/Rural Status for Connected Libraries.

Libraries Connected to the Internet by Population of Legal Service Area																
	Hardware Costs	Software Costs	Communi-cations Hardware Costs	Telecom-muni-cations Fees	Training Costs	Content Costs	Facilities Up-grades	Staffing Costs	Internet Connection Maintenance	Access to Reliable Telecom Services	Availability of State/Other Telecom Services	Availability of In-House Computer Expertise	Availability of Staff Time to Develop Internet Expertise	Availability of Federal/ State Money	Digital Copyright Fees	Concerns Over Access to Objectionable Material
Million +	1.63	2.91	1.96	1.32	2.00	2.76	1.96	1.84	2.70	1.63	3.27	1.26	1.27	2.48	2.53	2.01
500,000-999,999	1.75	2.29	1.77	1.34	1.98	2.11	2.23	1.59	2.22	1.86	2.47	1.38	1.47	2.43	2.15	1.90
100,000-499,999	1.80	2.43	1.99	1.62	2.25	2.73	2.37	1.98	2.34	1.93	2.58	1.56	1.56	2.20	2.91	2.41
25,000-99,999	1.83	2.48	2.08	1.76	2.26	2.66	2.49	2.05	2.30	1.97	2.34	1.67	1.62	2.12	2.92	2.46
5,000-24,999	1.77	2.25	1.99	1.59	2.14	2.65	2.44	2.12	2.12	1.97	2.24	1.73	1.65	1.83	2.80	2.42
LT 5,000	1.84	2.17	2.16	1.79	2.39	2.84	2.51	2.74	2.24	2.11	2.56	2.04	1.86	1.64	3.24	2.51
Overall	**1.80**	**2.29**	**2.06**	**1.69**	**2.25**	**2.71**	**2.47**	**2.30**	**2.21**	**2.01**	**2.39**	**1.81**	**1.70**	**1.85**	**2.97**	**2.45**

Urban/Rural Status																
	Hardware Costs	Software Costs	Communi-cations Hardware Costs	Telecom-muni-cations Fees	Training Costs	Content Costs	Facilities Up-grades	Staffing Costs	Internet Connection Maintenance	Access to Reliable Telecom Services	Availability of State/Other Telecom Services	Availability of In-House Computer Expertise	Availability of Staff Time to Develop Internet Expertise	Availability of Federal/ State Money	Digital Copyright Fees	Concerns Over Access to Objectionable Material
CC	1.75	2.34	2.04	1.59	2.23	2.55	2.46	2.01	2.22	1.92	2.54	1.73	1.65	2.24	2.74	2.39
NC	1.86	2.44	2.02	1.57	2.15	2.74	2.48	2.15	2.18	1.97	2.45	1.65	1.62	2.02	3.11	2.37
NO	1.78	2.19	2.09	1.77	2.31	2.72	2.46	2.41	2.23	2.05	2.34	1.90	1.76	1.71	2.92	2.50
Overall	**1.80**	**2.29**	**2.06**	**1.69**	**2.25**	**2.71**	**2.47**	**2.30**	**2.21**	**2.01**	**2.39**	**1.81**	**1.70**	**1.88**	**2.93**	**2.48**
1= Very Important 5=Very Unimportant																

Figure 7. 1996-1997 Public Library Internet Connectivity and Average Months Connected by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	1997	1996	Change in Percentage	Average Months Connected
Million +	100.0%	82.0%	18.0%	18.2
500,000-999,999	95.5%	93.1%	2.4%	24.0
100,000-499,999	93.1%	92.2%	0.9%	19.5
25,000-99,999	92.5%	74.1%	18.4%	14.7
5,000-24,999	79.2%	46.9%	32.3%	10.9
LT 5,000	56.3%	31.3%	25.0%	7.7
Overall	**72.3%**	**44.6%**	**27.7%**	**10.6**

Urban/Rural Status		
	Connected	Average Months Connected
CC	86.9%	16.1
NC	83.5%	14.3
NO	66.0%	8.4
Overall	**72.3%**	**10.6**
Urban/rural status data is not available for the 1996 data.		

that as public library population of legal service area decreases, the importance of the factors increases, particularly those factors related to Internet services costs. The data indicate that non-connected urban (CC) and rural (NO) libraries tend to consider the involvement factors more importantly than do non-connected suburban (NC) libraries.

As Figure 6 demonstrates, connected public libraries also consider all factors associated with Internet service provision to be important, but somewhat less so that non-connected libraries with importance ratings ranging from 1.69 to 2.71 (1=very important, 5=very unimportant). Key factors affecting connected public library involvement with the Internet include telecommunications costs (1.69), followed by the availability of staff time to develop expertise on the Internet (1.70), hardware/systems costs (1.80), the availability of in-house computer expertise (1.81), and the availability of state/federal money (1.85). The data

show little difference in importance ratings between connected urban (CC), suburban (NC), and rural (NO) libraries. Of interest, however, is that rural libraries rate the telecommunications costs as being less important (1.77) than do urban and suburban libraries, with ratings of 1.59 and 1.77 respectively.

The Current State of Public Library Internet Connectivity

The following section details the current state of public library connectivity, including the percentage of public libraries connected to the Internet, the type(s) of Internet connection public libraries have, the future Internet connectivity plans non-Internet connected public libraries have, the type of network connection provider public libraries use, and the estimated cost of public library Internet services. Comparisons to the 1994 and 1996 *Public Library Internet* studies are made where possible.

Percentage of Public Libraries Connected to the Internet and Population Served

At present, 72.3% of all public libraries have some type of Internet connection (see Figure 7). This is an increase of 27.7% from the 44.6% level of public library connectivity in 1996, and an increase of 49.8% from 1994. The data, however, show a clear pattern of connectivity by population of legal service area--library systems that serve populations of 25,000 and above enjoy a better than 90% connectivity rate (ranges from 92.5% for libraries with population of legal service areas of 25,000-99,999 and 100.0% for libraries with population of legal service areas of greater than one million). As Figure 7 indicates, the largest increases in public library Internet connectivity occurred in libraries with population of legal service areas between less than 5,000 and 99,999 (percentage increases ranging from 18.4% to 32.3%). It is worth noting, however, that libraries with population of legal service areas of greater than one million increased their Internet connectivity by 18.0% as well. On average, public libraries with larger population of legal service areas have had Internet connections the longest, with established connections ranging from 7.7 months for libraries with population of legal service areas of less than 5,000 up to 24.0 months for libraries with population of legal service areas of 500,000-999,999.

Public library Internet connectivity varies greatly by metropolitan status, with 86.9% of urban (CC) libraries connected to the Internet, followed by 83.5% of suburban (NC) libraries, and 66.0% of rural (NO) libraries (see Figure 7). Urban (CC) public libraries have been connected to the Internet for an average of 16.1 months, followed by suburban (NC) libraries with 14.3 months, and rural (NO) libraries with 8.4 months.

When public libraries not currently connected to the Internet were asked to indicate future Internet connectivity plans, 48.6% stated that their libraries planned to have some type of Internet connection by May 1998 (see Figure 8). Of that 48.6%, 6.8% indicated that the library planned to have a library staff only Internet connection, while 41.8% indicated that the library planned to have a library staff and public access Internet connection. As public library population of legal service area decreases, the percentage of public libraries indicating no Internet connection plans increases (percentages ranging from 0.0% for libraries serving populations of greater than 100,000 to 67.9% for libraries serving populations of less than 5,000). Public libraries that serve larger population of legal service areas, therefore, will continue to have greater percentages of public library Internet connections in general and public access-capable connections in particular. Indeed, nearly all public libraries that serve population of legal service areas of greater than 25,000 will have some type of Internet connection by May 1998.

As Figure 8 shows, future public library Internet connection plans vary dramatically by metropolitan status. A majority--59.2%--of public libraries in rural (NC) areas indicate that their libraries have no plans to connect to the Internet, whereas an overwhelming majority--100.0% for urban (CC) libraries and 75.9% for suburban (NC) libraries--will have some type of Internet connection by May 1998. More importantly, a majority of those connecting urban and suburban libraries will provide public access to the Internet, with 91.7% and 59.6% respectively. [Note: The survey collected connectivity data from library systems, not branches. For the 16.3% of systems with branches, the extent of branch level connectivity/planned connectivity is not known.]

Figure 8. Public Libraries Planning to Connect to the Internet in the Next 12 Months by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area			
	No Connection Planned	**Library Staff Use and Public Access**	**Library Staff Use Only**
Million +	0.0%	0.0%	0.0%
500,000-999,999	0.0%	100.0%	0.0%
100,000-499,999	0.0%	89.9%	10.1%
25,000-99,999	3.0%	57.1%	39.8%
5,000-24,999	19.8%	61.6%	18.6%
LT 5,000	67.9%	32.1%	0.0%
Overall	**51.4%**	**41.8%**	**6.8%**

Urban/Rural Status			
	No Connection Planned	**Library Staff Use and Public Access**	**Library Staff Use Only**
CC	0.0%	91.7%	8.3%
NC	24.1%	59.6%	16.3%
NO	59.2%	36.1%	4.7%
Overall	**51.4%**	**41.8%**	**6.8%**

Figure 9. 1994-1997 Connectivity and Projected Public Library Internet Connectivity.

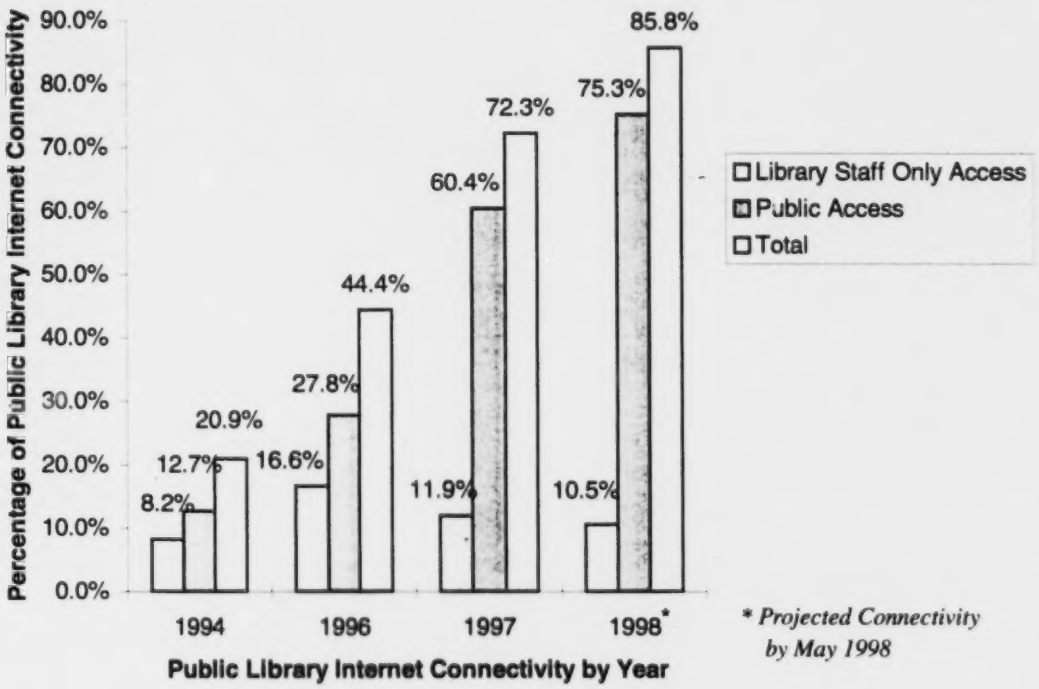
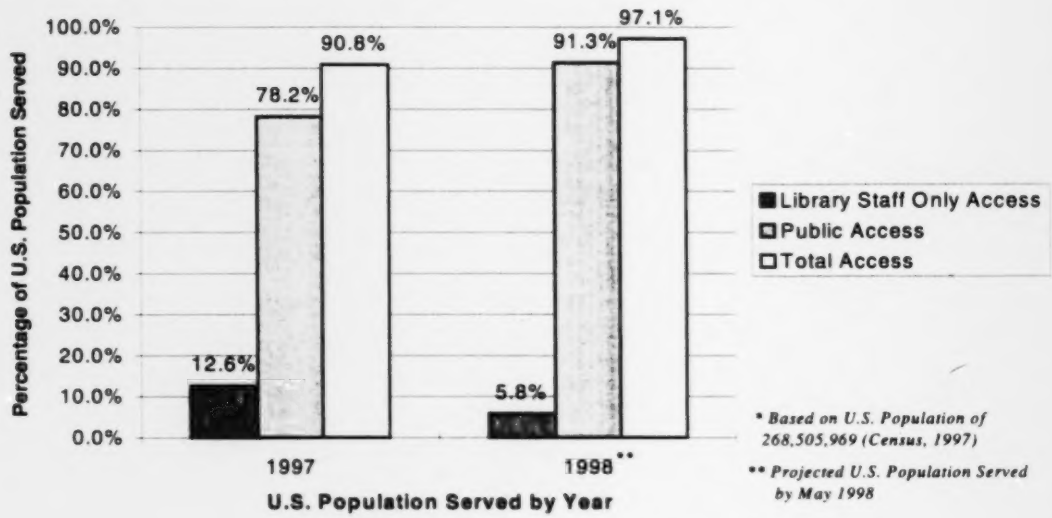


Figure 9 provides a slightly different view of the past, current, and future state of public library Internet connectivity. Of the 20.9% of public libraries connected to the Internet in 1994, slightly more public libraries provided public access Internet services (12.7%) than Internet services for library staff only (8.2%). In 1996, the growth in public access Internet services increased to 27.8% with only 16.6% of public libraries having library staff only Internet connections. For 1997, 11.9% of public libraries have library staff only access to the Internet, while 60.4% provide some type of public access to the Internet. Should public libraries not currently connected to the Internet follow-through with their connection plans by May 1998, 85.8% of public libraries will have some type of Internet connection, of which 75.3% will provide public access Internet services and 10.5% will provide library staff only Internet services. More public libraries that are connecting to the Internet, therefore, are providing public access Internet services than library staff only Internet services. Indeed, the percentage of public libraries connecting to the Internet for only staff use is decreasing. The authors note that the estimated 1998 public access figures may be underestimated due to some public libraries that currently have library staff only connections offering public access Internet services in the future.

Public library connectivity and planned connectivity presents only part of the Internet connection picture. A compelling question to answer is "What is the estimated population served by connected public libraries?" By using population of legal service area data contained in the public library Universe File (NCES, 1997), an estimated 90.8% of the U.S. population is served by a connected public library (see Figure 10). Of that 90.8%, 78.2% of the U.S. population has access to a public library that provides public access Internet services, while 12.6% have access to libraries that have library staff-only access to

Figure 10. U.S. Population Served by Public Libraries Connected to the Internet.*



the Internet. By combining planned Internet connectivity and population data, nearly the entire nation--97.1%--will have access to a connected public library (see Figure 10). More importantly, a vast majority of the U.S. population--91.3% will have access to a library with public access Internet services. [Note: Although only 16.3% of public library systems have branches, those that do represent significant portions of the U.S. population. Indeed, over 75% of library systems with branches have population of legal service areas of greater than 25,000. Branch connectivity data is not available currently.]

Type of Internet Connection, Connection Costs, and Connection Ratings

The following data details the type of Internet connection, bandwidth and speed of the connection, number of connection lines, and annual Internet connection costs. The percentages presented for this section will not total to 100.0%. The survey asked libraries to list all the types of connections and access speeds of their Internet connections and, as the data show, many libraries have multiple types of connections (see Figure 11).

As Figure 11 demonstrates, public libraries tend to have both dial-up and leased-line Internet connections. The data indicate, however, that larger library systems tend to have the greater percentage of both leased-line and dial-up connections, whereas smaller library systems tend to have dial-up connections. It is also worth noting that a clear majority (percentages ranging from 55.1% for libraries serving population of legal service areas of greater than 25,000 to 89.6% of libraries serving populations of legal service areas of greater than one million) have leased-line Internet connections. A majority of urban (CC) libraries have leased-lines with 64.1%, followed by suburban (NC) libraries with 47.0%, and rural (NO) libraries with 30.1%. Clearly, rural libraries rely on dial-up Internet connections (74.6%).

Figure 11. Connected Public Libraries with Dial-Up, Leased-Line, and Both Dial-Up and Leased-Line Connections by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area			
	Dial-Up	**Leased-Line**	**Both Dial-Up and Leased-Line**
Million +	51.9%	89.6%	41.5%
500,000-999,999	59.0%	86.0%	52.0%
100,000-499,999	71.3%	65.0%	40.1%
25,000-99,999	66.8%	55.1%	28.1%
5,000-24,999	72.8%	36.5%	18.8%
LT 5,000	79.5%	23.7%	20.3%
Of Connected Libraries	**73.6%**	**38.2%**	**22.8%**
Of All Libraries	**53.2%**	**27.6%**	**16.5%**

Urban/Rural Status			
	Dial-Up	**Leased-Line**	**Both Dial-Up and Leased-Line**
CC	61.8%	64.1%	33.5%
NC	74.3%	47.0%	27.4%
NO	74.6%	30.1%	18.9%
Of Connected Libraries	**73.6%**	**38.2%**	**22.8%**
Of All Libraries	**53.2%**	**27.6%**	**16.5%**

Figure 12 demonstrates further the pattern of dial-up versus leased-line connectivity, with smaller libraries (those serving populations of less than 99,999) tending not to have leased-lines (ranges from 26.4% to 31.2%). A similar pattern emerges with rural (NC) libraries, with 32.9% of rural libraries not having a leased-line connection.

Dial-Up and Leased-Line Connections

As Figure 13 shows, the most common type of dial-up Internet connection is Internet gateway access (e.g., a commercial provider such as America On-Line) with 36.4%. This is followed by 33.4% of public libraries having a workstation Serial Line Internet

Figure 12. Libraries with No Dial-Up or Leased-Line Connections by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area		
	No Dial-Up Connection	**No Leased-Line Connection**
Million +	21.2%	5.4%
500,000-999,999	22.9%	4.7%
100,000-499,999	11.8%	18.0%
25,000-99,999	16.2%	26.4%
5,000-24,999	6.9%	28.2%
LT 5,000	7.2%	31.2%
Overall	**9.3%**	**28.0%**

Urban/Rural Status		
	No Dial-up Connection	**No Leased-Line Connection**
CC	13.4%	16.2%
NC	10.4%	21.9%
NO	8.2%	32.9%
Overall	**9.3%**	**28.0%**

Protocol (SLIP) or Point-to-Point (PPP) connection and 21.0% of public libraries having terminal/text-based access. Overall, therefore, a majority of libraries--69.8%--have some type of graphical dial-up Internet connection. It is interesting to note that text/terminal access to the Internet decreased by 25.2% since 1996. The use of text/terminal access has decreased more so in libraries that serve populations of under 25,000.

Of interest in terms of metropolitan area dial-up connectivity is that a greater percentage of rural (NO) libraries have either an Internet gateway (41.7%) or SLIP/PPP (36.5%) connection than do urban (CC--32.1% and 29.0% respectively) and suburban (NC--29.1% and 29.5% respectively) libraries (see Figure 13). Based on the connectivity duration data presented in Figure 7, this stands to reason as rural libraries have only recently begun to connect to the Internet, thus enabling them to move directly into a graphical form of dial-up connectivity.

Figure 13. Public Library Type of Dial-up Internet Connection by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area												
	1997				1996				Change in Percentage			
	Internet Access Gateway	Workstation SLIP/PPP	Terminal Access	Other	Internet Access Gateway	Workstation SLIP/PPP	Terminal Access	Other	Internet Access Gateway	Workstation SLIP/PPP	Terminal Access	Other
Million +	28.8%	35.4%	35.8%	0.0%	25.8%	34.9%	39.3%	0.0%	3.0%	0.5%	-3.5%	0.0%
500,000-999,999	5.9%	35.4%	43.9%	14.8%	13.0%	35.3%	49.2%	2.4%	-7.1%	0.1%	-5.3%	12.4%
100,000-499,999	25.6%	37.4%	27.6%	9.3%	19.6%	33.3%	43.4%	3.9%	6.0%	4.1%	-15.8%	5.4%
25,000-99,999	36.9%	32.7%	22.7%	7.8%	20.8%	34.5%	40.1%	4.8%	16.1%	-1.8%	-17.4%	3.0%
5,000-24,999	34.8%	33.3%	19.1%	12.8%	14.7%	32.5%	48.3%	4.5%	20.1%	0.8%	-29.2%	8.3%
LT 5,000	40.5%	33.2%	20.3%	6.0%	26.7%	14.3%	50.9%	8.2%	13.8%	18.9%	-30.6%	-2.2%
Of Connected Libraries	**36.4%**	**33.4%**	**21.0%**	**9.2%**	**20.2%**	**28.4%**	**46.2%**	**5.3%**	**16.2%**	**5.0%**	**-25.2%**	**3.9%**
Of All Libraries	**26.3%**	**24.1%**	**15.2%**	**6.7%**	As the Population of Legal Service Area strata in 1996 study were different, some strata have been combined and averaged.							

Urban/Rural Status				
	Internet Access Gateway	**Workstation SLIP/PPP**	**Terminal Access**	**Other**
CC	32.1%	29.0%	28.5%	10.4%
NC	29.1%	29.5%	33.5%	7.8%
NO	41.7%	36.5%	12.0%	9.9%
Of Connected Libraries	**36.4%**	**33.4%**	**21.0%**	**9.2%**
Of All Libraries	**26.3%**	**24.1%**	**15.2%**	**6.7%**
There is no 1996 Urban/Rural Status data.				

Figure 14. Maximum Speed of Public Library Dial-Up Connection by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	Speed of Connection							
	14.4kbps	28.8kbps	33.6kbps	56kbps	64kbps	128kbps	Cable	Other
Million +	36.2%	36.2%	0.0%	9.4%	8.7%	9.4%	0.0%	0.0%
500,000-999,999	23.8%	41.8%	8.0%	7.9%	5.3%	5.3%	2.6%	5.2%
100,000-499,999	28.2%	41.2%	10.7%	10.9%	1.8%	2.9%	1.0%	3.3%
25,000-99,999	21.6%	45.4%	10.9%	11.6%	2.6%	1.4%	1.3%	5.2%
5,000-24,999	12.4%	49.5%	16.0%	15.0%	0.5%	1.1%	1.5%	4.1%
LT 5,000	21.4%	52.9%	17.9%	4.4%	0.0%	0.0%	0.0%	3.5%
Of Libraries Connected	**18.6%**	**49.2%**	**15.1%**	**10.3%**	**0.9%**	**0.9%**	**0.9%**	**4.1%**
Of All Libraries	**13.4%**	**35.6%**	**10.9%**	**7.4%**	**0.7%**	**0.7%**	**0.7%**	**3.0%**

Urban/Rural Status								
	Speed of Connection							
	14.4kbps	28.8kbps	33.6kbps	56kbps	64kbps	128kbps	Cable	Other
CC	22.7%	51.6%	9.7%	7.6%	1.8%	2.0%	1.1%	3.6%
NC	15.5%	53.6%	11.4%	7.6%	1.4%	1.8%	1.5%	7.1%
NO	19.9%	46.4%	17.9%	12.2%	0.5%	0.3%	0.5%	2.4%
Of Libraries Connected	**18.6%**	**49.2%**	**15.1%**	**10.3%**	**0.9%**	**0.9%**	**0.9%**	**4.1%**
Of All Libraries	**13.4%**	**35.6%**	**10.9%**	**7.4%**	**0.7%**	**0.7%**	**0.7%**	**3.0%**

As shown in Figure 14, most library dial-up connections operate at a rate of 28.8kbps with 49.2% of connected libraries (35.6% for all public libraries), followed by 18.6% operating at 14.4kbps (13.4% for all public libraries), 15.1% operating at 33.6kbps (10.9% for all public libraries), and 10.3% operating at 56kbps (7.4% for all public libraries). Perhaps due to the more recent connections of smaller public libraries (see Figure 7), libraries serving population of legal service areas of under 24,999 tend to have 28.8kbps or better dial-up connections. Very few public libraries use ISDN (64kbps or 128kbps) or cable dial-up connections. Those that do, however, serve populations of greater than 500,000.

Figure 15. Average Number of Dial-Up Lines by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area					
	14.4-56kbps	**64kbps**	**128kbps**	**Cable**	**Other**
Million +	27.6	3.0	30.0	0.0	0.0
500,000-999,999	18.3	2.0	14.0	0.0	2.0
100,000-499,999	7.0	2.2	3.0	1.0	3.3
25,000-99,999	2.8	1.4	1.0	1.7	2.0
5,000-24,999	1.7	0.0	1.0	1.5	1.0
LT 5,000	1.2	0.0	0.0	0.0	1.0
Overall	**2.2**	**1.6**	**2.6**	**1.5**	**2.2**

Urban/Rural Status					
	14.4-56kbps	**64kbps**	**128kbps**	**Cable**	**Other**
CC	4.5	1.3	9.7	3.5	6.7
NC	2.8	1.9	1.6	4.0	4.4
NO	1.7	1.5	3.1	1.0	1.2
Overall	**2.2**	**1.6**	**2.6**	**1.5**	**2.2**

As Figure 14 indicates, dial-up connection speed varies by metropolitan status, with rural (NO) libraries tending to have faster dial-up connection speeds as opposed to urban (CC) and suburban (NC) libraries. Nearly half of rural public libraries--46.4%--have a 28.8kbps connection, followed by a 33.6kbps connection with 17.9%, and a 56kbps connection with 12.2%. A majority of urban (51.6%) and suburban (53.6%) libraries, however, have a 28.8kbps connection, followed by 9.7% and 11.4% respectively with a 33.6kbps connection, and 7.6% and 7.6% respectively with a 56kbps connection. Urban and suburban libraries make limited use of Integrated Services Digital Network (ISDN) and cable dial-up connections.

The average number of phone lines for the 14.4kbps-56kbps dial-up connections is 2.2, with the average number ranging from 1.2 for libraries with population of legal service areas of less than 5,000 to 27.6 for libraries with population of legal service areas of one million or greater (see Figure 15). Libraries serving population of legal service areas of greater than 500,000 have the greatest number of ISDN lines (64kbps and 128 kbps). In general, however, libraries that serve smaller populations do not use ISDN technologies for dial-up Internet connectivity. Figure 14 also indicates that urban (CC) library systems tend to have more dial-up lines than do suburban (NC) and rural (NO) libraries.

Figure 16. Average Cost of Dial-Up Lines by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area					
	14.4-56kbps	**64kbps**	**128kbps**	**Cable**	**Other**
Million +	$354.30	$312.00	$640.00	N/A	N/A
500,000-999,999	$694.40	N/A	$8,125.00	N/A	$870.00
100,000-499,999	$842.58	$1,800.00	$10,034.41	$6,500.00	$1,868.11
25,000-99,999	$574.39	$1,265.60	$220.98	$751.37	$4,299.01
5,000-24,999	$655.63	$200.00	$696.00	$329.92	$314.61
LT 5,000	$362.45	N/A	N/A	N/A	N/A
Overall	**$548.09**	**$1,076.87**	**$5,021.38**	**$677.17**	**$1,522.72**

Urban/Rural Status					
	14.4-56kbps	**64kbps**	**128kbps**	**Cable**	**Other**
CC	$684.78	$547.01	$2,449.23	N/A	$2,037.62
NC	$518.96	$1,260.47	$1,269.86	$666.13	$2,079.71
NO	$548.59	$1,010.61	$14,314.46	$751.37	$412.58
Overall	**$548.09**	**$1,076.87**	**$5,021.38**	**$677.17**	**$1,522.72**

Figure 16 shows the average annual costs for public library dial-up connections. On average, annual POTS (Plain Old Telephone Service) lines cost libraries $548.09, while annual 64kbps 1B+D ISDN service costs $1,076.87, 128kbps 2B+D ISDN service costs $5,021.38, and cable service costs $1,522.72. The data, however, show no clear average cost patterns between the population of legal service area categories. For costs by metropolitan status, however, a pattern does emerge. The data indicate that average POTS costs between urban (CC), suburban (NC), and rural (NO) libraries are relatively similar, with average urban costs of $684.78, average Suburban costs of $518.96, and average rural costs of $548.59. For 128kbps ISDN service, though, urban and suburban libraries pay substantially less ($2,449.23 and $1,269.86 respectively) than do rural libraries ($14,314.46).

While the cost data presented accurately reflect the responses provided by participating libraries, readers should note the difficulty libraries have in determining Internet-related costs. Appendix A discusses these difficulties in detail.

Public libraries that access the Internet through leased-line connections are equally likely to do so through an on-line public access catalog (OPAC) gateway and a local area network (LAN), with 35.7%

Figure 17. Public Library Type and Maximum Speed of Leased-Line Connection by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area										
	Type of Leased-Line Connection				Maximum Speed of Leased-Line Connection					
	OPAC	LAN	WAN	Other	56kbps	64kbps	128kbps	T1	T3	Other
Million +	34.0%	25.9%	37.1%	2.9%	21.6%	0.0%	8.6%	61.3%	0.0%	8.6%
500,000-999,999	32.0%	27.9%	37.4%	2.6%	19.2%	3.5%	9.1%	59.1%	0.0%	8.0%
100,000-499,999	34.0%	28.8%	33.3%	3.9%	38.6%	9%	7.6%	41.9%	0.0%	10.0%
25,000-99,999	36.9%	31.7%	24.6%	6.8%	51.8%	3.2%	7.1%	28.3%	0.0%	9.7%
5,000-24,999	38.6%	34.3%	17.7%	9.3%	62.4%	1.1%	3.2%	22.5%	0.0%	10.9%
LT 5,000	29.8%	46.3%	19.6%	4.3%	75.5%	0.0%	6.1%	12.1%	0.0%	6.2%
Of Connected Libraries	**35.7%**	**34.9%**	**22.7%**	**6.7%**	**56.1%**	**1.7%**	**5.8%**	**26.9%**	**0.0%**	**9.4%**
Of All Libraries	**25.8%**	**25.2%**	**16.4%**	**4.8%**	**40.6%**	**1.2%**	**4.2%**	**19.4%**	**0.0%**	**6.8%**

Urban/Rural Status										
	Type of Leased-Line Connection				Maximum Speed of Leased-Line Connection					
	OPAC	LAN	WAN	Other	56kbps	64kbps	128kbps	T1	T3	Other
CC	33.9%	33.2%	28.7%	4.2%	37.6%	4.4%	6.8%	38.7%	0.0%	12.2%
NC	40.5%	27.6%	22.4%	9.6%	50.3%	1.8%	7.2%	27.0%	0.0%	13.7%
NO	31.7%	42.2%	21.3%	4.8%	67.9%	0.9%	4.0%	22.9%	0.0%	4.4%
Of Connected Libraries	**35.7%**	**34.9%**	**22.7%**	**6.7%**	**56.1%**	**1.7%**	**5.8%**	**26.9%**	**0.0%**	**9.4%**
Of All Libraries	**25.8%**	**25.2%**	**16.4%**	**4.8%**	**40.6%**	**1.2%**	**4.2%**	**19.4%**	**0.0%**	**6.8%**

and 34.9%, respectively (see Figure 17). A fair percentage of public libraries, 22.7%, also access the Internet through a wide area network (WAN). Although not depicted in Figure 16, the percentage of OPAC access decreased by 13.0% and LAN access decreased by 2.7% since 1996. It is interesting to note that the percentage of smaller public libraries using LAN technologies has increased since the 1996 study, particularly for public libraries serving population of legal service areas of under 25,000. Meanwhile, public libraries serving population of legal service areas of over 25,000 are increasingly using WAN connection technologies. Figure 17 also shows that public libraries in suburban (NC) areas make the most use of OPAC connectivity with 40.5%, whereas rural (NO) libraries make the most use of LAN connectivity with 42.2%. Interestingly, the use of WAN connectivity is nearly even across urban (CC),

Figure 18. Average Number of Leased-Lines by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area						
	56kbps	**64kbps**	**128kbps**	**T1**	**T3**	**Other**
Million +	28.5	0.0	62.0	9.7	0.0	15.0
500,000-999,999	8.3	33.5	8.4	4.9	0.0	9.8
100,000-499,999	4.5	1.3	3.8	1.6	0.0	3.1
25,000-99,999	2.4	1.1	1.8	1.4	0.0	1.7
5,000-24,999	1.3	1.0	2.0	1.3	0.0	6.0
LT 5,000	1.6	0.0	0.0	1.0	0.0	6.0
Overall	**2.1**	**4.0**	**3.3**	**1.8**	**0.0**	**3.0**

Urban/Rural Status						
	56kbps	**64kbps**	**128kbps**	**T1**	**T3**	**Other**
CC	4.6	5.3	7.1	9.7	0.0	2.8
NC	2.3	4.7	2.5	1.7	0.0	3.3
NO	1.6	1.0	1.8	1.4	0.0	1.8
Overall	**2.1**	**4.0**	**3.3**	**1.8**	**0.0**	**3.0**

suburban (NC), and rural (NO) libraries, with 28.7%, 22.4%, and 21.3% respectively.

Public libraries with leased-line Internet connections most commonly access the Internet through a 56kbps line (see Figure 17) with 56.1%, followed by a T1 line with 26.9%, and Other with 9.4% (e.g., ATM switched networks, wireless technologies). The data show that libraries make little use of ISDN connections (1.7% for 64kbps 1B+D service, and 5.8% for 128kbps 2B+D service). It is noteworthy that urban (CC) libraries make the most use of T1 connections with 38.7%, followed by suburban libraries with 27.0% and rural libraries with 22.9%.

On average, libraries have 2.1 56kbps lines and 1.8 T1 lines (see Figure 18). Although few libraries use ISDN connections, those that do have an average of 4.0 lines for 64kbps 1B+D service and 3.3 lines for 128kbps 2B+D service. As expected, the average number of 56kbps (range of 1.3 to 28.5), T1 (range of 1.0 to 9.7), and ISDN (range of 0.0 to 62.0) lines increases as does the population of legal service area. Urban (CC) libraries have the greatest average number of lines for 56kbps connectivity (28.5 lines), T1 connectivity (9.7 lines), 64kbps 1B+D connectivity (5.3 lines), and 128kbps 2B+D connectivity (7.1 lines).

Figure 19. Average Cost of Leased-Lines by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area						
	56kbps	**64kbps**	**128kbps**	**T1**	**T3**	**Other**
Million +	$1,025.95	N/A	$2,070.46	$5,556.95	N/A	$788.81
500,000-999,999	$1,858.72	$1,400.00	$4,666.51	$12,467.30	N/A	$14,759.54
100,000-499,999	$3,678.66	$1,200.00	$2,436.41	$9,947.07	N/A	$9,082.26
25,000-99,999	$2,828.14	$1,444.92	$3,254.70	$7,323.41	N/A	$3,828.16
5,000-24,999	$3,055.84	$948.00	$1,493.42	$5,066.83	N/A	$3,130.34
LT 5,000	$1,749.98	N/A	N/A	$3,955.59	N/A	$500.00
Overall	**$2,693.70**	**$1,342.65**	**$2,806.41**	**$7,396.66**	**N/A**	**$3,889.84**

Urban/Rural Status						
	56kbps	**64kbps**	**128kbps**	**T1**	**T3**	**Other**
CC	$3,516.71	$1,312.34	$3,649.79	$7,267.98	N/A	$6,598.98
NC	$3,756.12	$1,982.19	$2,763.04	$7,145.56	N/A	$3,347.25
NO	$1,918.47	$1,201.10	$1,619.58	$8,003.54	N/A	$3,560.80
Overall	**$2,693.70**	**$1,342.65**	**$2,806.41**	**$7,396.66**	**N/A**	**$3,889.84**

As Figure 19 shows, the average annual cost for a T1 line is $7,396.66, followed by $2,806.41 for a 128kbps 2B+D line, $2,693.70 for a 56kbps line, and $1,342.65 for a 64kbps 1B+D line. The cost data, however, show no clear patterns of cost for the lines by either population of legal service area or metropolitan status. Indeed, annual average costs for a 56kbps line in Rural (NO) areas is less--$1,918.47--than in urban (CC) and suburban (NC) libraries, with $3,516.71 and $3,756.12 respectively. On the other hand, a T1 line is more costly for rural libraries ($8,003.54) than for urban ($7,267.98) and Suburban ($7,145.56) libraries.

Public Library Connection Ratings

Overall, libraries rate their Internet connections on the cusp between adequate and somewhat inadequate (See Figure 20). Libraries indicate little trouble with accessing a reliable Internet service provider (ISP) with a rating of 2.22 (1=Very Adequate, 5=Very Inadequate), followed by having sufficient bandwidth (e.g., speed of connection) with a rating of 2.80, LAN capabilities (e.g., speed, capacity) with a rating of 2.82, accessing multi-media information (e.g., full motion video, sound, images) with a rating of 3.20, and availability of public access Internet workstations with a rating of 3.26. The data further show that, generally, as library population of legal service increases, dissatisfaction with the library's Internet connection

Figure 20. Library Adequacy of Internet Connection by Population and Urban/Rural Status.

Population of Legal Service Area					
	Multi-Media	**Bandwidth**	**LAN Capabilities**	**Reliable ISP**	**Public Access Workstations**
Million +	3.56	3.07	2.38	1.99	3.64
500,000-999,999	3.38	2.82	2.65	1.97	3.30
100,000-499,999	3.67	3.06	2.95	2.26	3.24
25,000-99,999	3.33	2.83	2.81	2.18	3.36
5,000-24,999	3.08	2.78	2.99	2.15	3.27
LT 5,000	3.17	2.75	2.62	2.33	3.16
Overall	**3.20**	**2.80**	**2.82**	**2.22**	**3.26**

Urban/Rural Status					
	Multi-Media	**Bandwidth**	**LAN Capabilities**	**Reliable ISP**	**Public Access Workstations**
CC	3.48	2.90	2.71	2.14	3.27
NC	3.48	2.93	3.10	2.21	3.47
NO	3.01	2.71	2.66	2.24	3.13
Overall	**3.20**	**2.80**	**2.82**	**2.22**	**3.26**
1=Very Adequate 5=Very Inadequate					

increases. The exception to this is the "accessing a reliable ISP" response, with larger library systems expressing greater satisfaction with their ability to access reliable ISPs. It is interesting to note that rural (NO) libraries tend to rate their library's Internet connection less favorably than do urban (CC) and suburban (NC) libraries for multi-media capabilities and public access workstations. Conversely, rural libraries rate their connections more highly than do suburban and rural libraries for bandwidth and LAN capabilities.

Internet Public Library Uses and Public Access Services

This section details the types and extent of public access Internet services that public libraries make available to patrons, and library ratings of library public access technologies.

Figure 21. Public Library System Branches by Population of Legal Service Area.

Population of Legal Service Area	Number of Public Libraries	Number of Libraries with Branches	Number of Branches
Million +	20	20	836
500,000-999,999	49	49	1,017
100,000-499,999	392	360	2,538
25,000-99,999	1,397	636	1,875
5,000-24,999	3,143	343	687
LT 5,000	3,950	47	71
Overall	**8,921**	**1,455**	**7,024**

From 1994 public library data (NCES, 1997), the most currently available public library outlet data.

Public Library Provision of Public Access Internet Services

For this section, the survey asked public libraries to indicate the Internet-based services to which they provided public access. Responding libraries could answer in the following ways: "No", "At Main/Central Library Only", "At Main/Central Library and All Branches", and "At Main/Central Library and Some Branches". Readers should note the following:

- Not all public library systems have a central or main library. Those that do not were asked to answer the questions as though they did; and
- A vast majority of public library systems do not have branches, particularly library systems that serve populations of legal service areas of under 25,000 (see Figure 21). Those that do not would therefore answer the public access services questions with the "At Main/Central Library Only" choice. As such, those libraries will show a deficiency of public access services to the "At Main/Central Library and All Branches" and "At Main/Central Library and Some Branches" options.

Readers should keep these two factors in mind as they read the following section on types of public library Internet services.

Also, Figures 22-33 provide both connected and total public library data. For presentation purposes, this section only discusses the connected library data.

Overall, a majority of public libraries provide some type of public access Internet services (see Figure 22). However, libraries do not provide public access equally to all services.

Of connected libraries, 82.0% do not provide public access to e-mail services, while 12.8% provide public access to e-mail services at the Main/Central Library, 3.9% at the Main/Central Library and All Branches, and 1.2% at the Main and Central Library and Some Branches (see Figure 23). The data indicate that libraries that serve population of legal service areas of 5,000-24,999 and less than 5,000 provide the highest percentage of public access e-mail services in the Main/Central Library with 11.3% and 19.9% respectively. Figure 23 also shows that libraries that serve population of legal service areas of 500,000-999,999 and over one million provide the highest percentage of e-mail services in the Main/Central

Figure 22. Public Libraries Providing Public Access by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area		
	Percentage of Connected Libraries	**Percentage of All Libraries**
Million +	89.2%	89.2%
500,000-999,999	90.9%	86.8%
100,000-499,999	85.1%	79.2%
25,000-99,999	81.3%	75.2%
5,000-24,999	84.6%	67.0%
LT 5,000	82.4%	46.9%
Overall	**83.6%**	**60.4%**

Urban/Rural Status		
	Percentage of Connected Libraries	**Percentage of All Libraries**
CC	86.9%	75.5%
NC	84.4%	70.5%
NO	82.8%	54.6%
Overall	**83.6%**	**60.4%**

Library and All Branches, with 15.4% and 16.0% respectively. Of further interest is that rural (NO) libraries provide the highest percentage of public access e-mail services in the Main/Central Library with 16.5% (see Figure 23).

As Figure 24 demonstrates, 71.9% of connected libraries do not provide public access newsgroup services, followed by 20.5% that provide public access to newsgroup services at the Main/Central Library, 5.7% at the Main/Central Library and All Branches, and 1.9% at the Main and Central Library and Some Branches. Libraries that serve population of legal service areas of under 99,999 provide the highest percentage of public access newsgroup services at the Main/Central Library (range of 16.4% to 23.8%), while libraries that serve population of legal service areas of over 500,000 provide the highest percentage of public access newsgroup services at the Main/Central Library and All Branches (range of 10.4% to 20.0%). Suburban (NC) and rural (NO) libraries provide the highest percentage of newsgroup services at the

Figure 23. Public Library Public Access E-mail Internet Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	79.6%	57.6%	5.0%	3.6%	15.4%	11.1%	0.0%	0.0%
500,000-999,999	81.7%	59.1%	0.0%	0.0%	16.0%	11.6%	2.3%	1.7%
100,000-499,999	90.5%	65.4%	2.4%	1.7%	5.7%	4.1%	1.4%	1.0%
25,000-99,999	86.3%	62.4%	7.8%	5.6%	3.4%	2.5%	2.6%	1.9%
5,000-24,999	85.0%	61.5%	11.3%	8.2%	3.2%	2.3%	0.4%	0.3%
LT 5,000	74.5%	53.9%	19.9%	14.4%	4.3%	3.1%	1.3%	0.9%
Overall	**82.0%**	**59.3%**	**12.8%**	**9.3%**	**3.9%**	**2.8%**	**1.2%**	**0.9%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	85.6%	61.9%	7.7%	5.6%	5.2%	3.8%	1.5%	1.1%
NC	86.3%	62.4%	7.5%	5.4%	5.3%	3.8%	0.9%	0.7%
NO	79.2%	57.3%	16.5%	11.9%	2.9%	2.1%	1.2%	0.9%
Overall	**82.0%**	**59.3%**	**12.8%**	**9.3%**	**3.9%**	**2.8%**	**1.2%**	**0.9%**

Figure 24. Public Library Public Access Newsgroup Internet Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	79.6%	57.6%	5.0%	3.6%	10.4%	7.5%	5.0%	3.6%
500,000-999,999	73.1%	52.9%	2.3%	1.7%	20.0%	14.5%	4.6%	3.3%
100,000-499,999	81.5%	58.9%	5.6%	4.0%	8.9%	6.4%	3.9%	2.8%
25,000-99,999	73.2%	52.9%	16.4%	11.9%	7.4%	5.4%	2.9%	2.1%
5,000-24,999	70.7%	51.1%	22.4%	16.2%	5.3%	3.8%	1.5%	1.1%
LT 5,000	70.6%	51.1%	23.8%	17.2%	4.3%	3.1%	1.3%	0.9%
Overall	**71.9%**	**5[illegible]**	**20.5%**	**14.8%**	**5.7%**	**4.1%**	**1.9%**	**1.4%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	70.6%	51.0%	16.5%	11.9%	10.9%	7.9%	2.0%	1.4%
NC	71.2%	51.5%	21.0%	15.2%	5.8%	4.2%	1.9%	1.4%
NO	72.4%	52.3%	20.7%	15.0%	5.1%	3.7%	1.9%	1.4%
Overall	**71.9%**	**52.0%**	**20.5%**	**14.8%**	**5.7%**	**4.1%**	**1.9%**	**1.4%**

Figure 25. Public Library Public Access FTP Internet Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	58.1%	42.0%	0.0%	0.0%	31.5%	22.8%	10.4%	7.5%
500,000-999,999	52.1%	37.7%	0.0%	0.0%	41.1%	29.7%	6.8%	4.9%
100,000-499,999	56.8%	41.1%	8.7%	6.3%	23.5%	17.0%	11.0%	8.0%
25,000-99,999	54.4%	39.3%	53.9%	39.0%	12.2%	8.8%	4.2%	3.0%
5,000-24,999	51.9%	37.5%	37.6%	27.2%	8.7%	6.3%	1.7%	1.2%
LT 5,000	71.9%	52.0%	33.0%	23.9%	4.3%	3.1%	0.0%	0.0%
Overall	**59.4%**	**42.9%**	**29.2%**	**21.1%**	**9.2%**	**6.7%**	**2.3%**	**1.7%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	48.6%	35.1%	26.1%	18.9%	19.8%	14.3%	5.5%	4.0%
NC	56.3%	40.7%	27.2%	19.7%	13.2%	9.5%	3.2%	2.3%
NO	62.4%	45.1%	30.8%	22.3%	5.5%	4.0%	1.3%	0.9%
Overall	**59.4%**	**42.9%**	**29.2%**	**21.1%**	**9.2%**	**6.7%**	**2.3%**	**1.7%**

Figure 26. Public Library Public Access Text-based World-Wide Web Internet Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	53.1%	38.4%	0.0%	0.0%	36.5%	26.4%	10.4%	7.5%
500,000-999,999	38.9%	28.1%	0.0%	0.0%	54.4%	39.3%	6.7%	4.8%
100,000-499,999	55.7%	40.3%	6.5%	4.7%	30.2%	21.8%	7.7%	5.6%
25,000-99,999	61.6%	44.5%	22.5%	16.3%	12.6%	9.1%	3.3%	2.4%
5,000-24,999	48.8%	35.3%	38.8%	28.0%	9.9%	7.2%	2.5%	1.8%
LT 5,000	71.2%	51.5%	25.4%	18.4%	2.2%	1.6%	1.3%	0.9%
Overall	**59.2%**	**42.8%**	**28.7%**	**20.8%**	**9.5%**	**6.9%**	**2.6%**	**1.9%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	49.6%	35.9%	21.1%	15.3%	25.1%	18.1%	4.2%	3.0%
NC	54.4%	39.3%	26.7%	19.3%	14.4%	10.4%	14.4%	10.4%
NO	63.1%	45.6%	30.8%	22.3%	4.8%	3.5%	1.3%	0.9%
Overall	**59.2%**	**42.8%**	**28.7%**	**20.8%**	**9.5%**	**6.9%**	**2.6%**	**1.9%**

Figure 27. Public Library Public Access Graphical World-Wide Web Internet Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	15.8%	11.4%	10.4%	7.5%	36.9%	26.7%	36.9%	26.7%
500,000-999,999	20.5%	14.8%	4.7%	3.4%	45.6%	33.0%	29.3%	21.2%
100,000-499,999	31.2%	22.6%	15.7%	11.4%	32.1%	23.2%	21.0%	15.2%
25,000-99,999	29.6%	21.4%	44.6%	32.2%	18.3%	13.2%	7.6%	5.5%
5,000-24,999	23.8%	17.2%	60.4%	43.7%	13.2%	9.5%	2.6%	1.9%
LT 5,000	31.5%	22.8%	61.6%	44.5%	4.3%	3.1%	2.6%	1.9%
Overall	**27.9%**	**20.2%**	**54.4%**	**39.3%**	**12.7%**	**9.2%**	**5.0%**	**3.6%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	25.9%	18.7%	35.3%	25.5%	26.4%	19.1%	12.3%	8.9%
NC	31.8%	23.0%	46.8%	33.8%	16.6%	12.0%	4.8%	3.5%
NO	25.9%	18.7%	61.1%	44.2%	8.8%	6.4%	4.2%	3.0%
Overall	**27.9%**	**20.2%**	**54.4%**	**39.3%**	**12.7%**	**9.2%**	**5.0%**	**3.6%**

Figure 28. Public Library Public Access Online Database Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	42.3%	30.9%	10.4%	7.5%	41.9%	30.3%	5.4%	3.9%
500,000-999,999	31.7%	22.9%	11.3%	8.2%	47.8%	34.6%	9.2%	6.7%
100,000-499,999	54.3%	39.3%	11.4%	8.2%	27.8%	20.1%	6.6%	4.8%
25,000-99,999	66.3%	47.9%	20.3%	14.7%	11.0%	8.0%	2.4%	1.7%
5,000-24,999	71.4%	51.6%	20.8%	15.0%	6.5%	4.7%	1.2%	0.9%
LT 5,000	85.6%	61.9%	14.4%	10.4%	0.0%	0.0%	0.0%	0.0%
Overall	**73.7%**	**53.3%**	**17.9%**	**12.9%**	**6.9%**	**5.0%**	**1.4%**	**1.0%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	59.3%	42.9%	15.8%	11.4%	22.7%	16.4%	2.2%	1.6%
NC	62.8%	45.4%	24.2%	17.5%	11.3%	8.2%	1.7%	1.2%
NO	81.7%	59.1%	14.5%	10.5%	2.6%	1.9%	1.2%	0.9%
Overall	**73.7%**	**53.3%**	**17.9%**	**12.9%**	**6.9%**	**5.0%**	**1.4%**	**1.0%**

Figure 29. Public Library Public Access Online CD Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	26.1%	18.9%	21.2%	15.3%	21.2%	15.3%	31.5%	22.8%
500,000-999,999	41.0%	29.6%	4.5%	3.3%	20.5%	14.8%	34.1%	24.7%
100,000-499,999	60.2%	43.5%	10.5%	7.6%	17.7%	12.8%	11.6%	8.4%
25,000-99,999	64.6%	46.7%	21.6%	15.6%	11.1%	8.0%	2.6%	1.9%
5,000-24,999	68.3%	49.4%	24.7%	17.9%	5.3%	3.8%	1.7%	1.2%
LT 5,000	76.1%	55.0%	23.9%	17.3%	0.0%	0.0%	0.0%	0.0%
Overall	**69.3%**	**50.1%**	**22.8%**	**16.5%**	**5.6%**	**4.0%**	**2.3%**	**1.7%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	51.1%	36.9%	23.4%	16.9%	17.2%	12.4%	8.3%	6.0%
NC	70.2%	50.8%	19.1%	13.8%	7.5%	5.4%	3.2%	2.3%
NO	71.0%	51.3%	24.8%	17.9%	3.1%	2.2%	1.0%	0.7%
Overall	**69.3%**	**50.1%**	**22.8%**	**16.5%**	**5.6%**	**4.0%**	**2.3%**	**1.7%**

Figure 30. Public Library Public Access Online Reference Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	79.2%	57.3%	10.4%	7.5%	10.4%	7.5%	0.0%	0.0%
500,000-999,999	73.0%	52.8%	4.2%	3.0%	20.5%	14.8%	2.2%	1.6%
100,000-499,999	77.3%	55.9%	11.4%	8.2%	9.2%	6.7%	2.1%	1.5%
25,000-99,999	74.8%	54.1%	16.9%	12.2%	5.7%	4.1%	2.5%	1.8%
5,000-24,999	74.2%	53.6%	23.1%	16.7%	2.2%	1.6%	0.6%	0.4%
LT 5,000	61.7%	44.6%	34.9%	25.2%	2.2%	1.6%	1.3%	0.9%
Overall	**70.3%**	**50.8%**	**24.9%**	**18.0%**	**3.5%**	**2.5%**	**1.3%**	**0.9%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	71.9%	52.0%	17.2%	12.4%	9.5%	6.9%	1.5%	1.1%
NC	71.6%	51.8%	22.2%	16.1%	5.0%	3.6%	1.2%	0.9%
NO	69.4%	50.2%	27.4%	19.8%	1.9%	1.4%	1.3%	0.9%
Overall	**70.3%**	**50.8%**	**24.9%**	**18.0%**	**3.5%**	**2.5%**	**1.3%**	**0.9%**

Figure 31. Public Library Public Access to Special Software/Hardware for Individuals with Disabilities by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
Million +	41.5%	30.0%	15.8%	11.4%	10.4%	7.5%	32.3%	23.4%
500,000-999,999	50.0%	36.2%	15.9%	11.5%	9.1%	6.6%	25.0%	18.1%
100,000-499,999	72.7%	52.6%	13.4%	9.7%	4.9%	3.5%	9.0%	6.5%
25,000-99,999	84.6%	61.2%	10.7%	7.7%	2.9%	2.1%	1.7%	1.2%
5,000-24,999	92.6%	66.9%	4.6%	3.3%	2.3%	1.7%	0.3%	0.2%
LT 5,000	92.8%	67.1%	2.9%	2.1%	4.3%	3.1%	0.0%	0.0%
Overall	**89.4%**	**64.6%**	**5.9%**	**4.3%**	**3.3%**	**2.4%**	**1.3%**	**0.9%**

Urban/Rural Status								
	None		At Main/ Central Library Only		At Main/Central Library and All Branches		At Main/Central Library and Some Branches	
	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries	Of Connected Libraries	Of All Libraries
CC	75.6%	54.7%	15.4%	11.1%	3.5%	2.5%	5.5%	4.0%
NC	86.6%	62.6%	7.0%	5.1%	4.7%	3.4%	1.6%	1.2%
NO	92.6%	66.9%	4.2%	3.0%	2.5%	1.8%	0.6%	0.4%
Overall	**89.4%**	**64.6%**	**5.9%**	**4.3%**	**3.3%**	**2.4%**	**1.3%**	**0.9%**

Main/Central Library, with 21.0% and 20.7% respectively. Urban libraries (CC) provide the highest percentage--10.9%--of public access newsgroup services at Main/Central Libraries and All Branches.

Overall, 59.4% of connected public libraries do not provide public access to FTP (File Transfer Protocol) services, followed by 29.2% that provide public access to FTP services at the Main/Central Library, 9.2% at the Main/Central Library and All Branches, and 2.3% at the Main and Central Library and Some Branches (see Figure 25). Libraries that serve populations of under 100,000 provide the greatest public access to FTP services in Main/Central Libraries (range of 33.0% to 52.9%), while libraries that serve population of legal service areas of over one million and 500,000-999,999 provide the highest percentage of public access FTP services in Main/Central Libraries and All Branches with 31.5% and 41.1% respectively. Of interest is that nearly the same amount of urban (CC), suburban (NC), and rural (NO) libraries provide FTP services in Main/Central Libraries, with 26.1%, 27.2%, and 30.8% respectively.

Of the public libraries that provide text-based public access Web services, 28.7% provide such services at the Main/Central Library, followed by 9.5% that provide text-based Web services at the Main/Central Library and All Branches, and 2.6% that provide text-based Web services at the Main/Central Library and Some Branches (see Figure 26). Overall, public libraries that serve population of legal service areas of under 100,000 provide the greatest public access to text-based Web services in Main/Central Libraries (range of 22.5%-38.8%), while libraries that serve population of legal service areas of over 100,000 provide the highest percentage of public access text-based Web services in Main/Central Libraries and All Branches (range of 30.2% to 54.4%). It is interesting to note that Rural (NO) libraries provide the highest percentage--30.8%--of access to text-based Web services in Main/Central Libraries, whereas urban (CC) libraries provide the highest percentage--25.1%--of text-based access in Main/Central Libraries and All Branches.

As Figure 27 indicates, only 27.9% of connected public libraries do not provide public access to graphical Web services. This is followed by 54.4% of public libraries that provide public access to graphical Web services at the Main/Central Library, 12.7% at the Main/Central Library and All Branches, and 5.0% at the Main and Central Library and Some Branches. Libraries that serve populations of under 100,000 provide the greatest public access to graphical Web services in Main/Central Libraries (range of 44.6% to 61.6%), while libraries that serve population of legal service areas of over 100,000 provide the highest percentage of public access graphical Web services in Main/Central Libraries and All Branches (range of 32.1% to 45.6%). Rural (NO) libraries provide the greatest public access to graphical Web services in Main/Central Libraries with 61.1%, followed by 46.8% of suburban (NC) libraries and 35.3% of urban (CC) libraries. Urban (CC) libraries provide the highest percentage--26.4%--of graphical access in Main/Central Libraries and All Branches.

Overall, 73.7% of public libraries do not provide public access to online database services, followed by 17.9% that do provide public access to online database services at the Main/Central Library, 6.9% at the Main/Central Library and All Branches, and 1.4% at the Main and Central Library and Some Branches (see Figure 28). Libraries that serve population of legal service areas of 25,000-99,999 and 5,000-24,999 provide the greatest percentage of public access to online database services at the Main/Central Library with 20.3% and 20.8% respectively. Libraries that serve population of legal service areas of over one million and 500,000-999,999 provide the largest percentage of public access to online database services at the Main/Central Library and All Branches with 41.9% and 47.8% respectively. Suburban (NC) libraries provide the highest percentage--24.2%--of public access to online databases at the Main/Central Library, whereas urban (CC) libraries provide the highest percentage--22.7%--of public access to online databases at the Main/Central Library and All Branches.

Of the connected libraries that provide online access to CD services, 22.8% do so at the at the Main/Central Library, 5.6% at the Main/Central Library and All Branches, and 2.3% at the Main and Central Library and Some Branches (see Figure 29). It is interesting to note that nearly the same percentage, with the exception of libraries that serve population of legal service areas of 500,000-999,999 (4.5%) and 100,000-499,999 (10.5%), provide similar access to online CD services (range of 21.2% to 24.7%). Libraries that serve population of legal service areas of greater than 100,000 provide the highest percentage of public access to online CD services at the Main/Central Library and All Branches (range of 17.7% to 21.2%).

Figure 32. Remote/Dial-In Public Access Services by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area		
	Percentage of Connected Libraries	**Percentage of All Libraries**
Million +	26.1%	26.1%
500,000-999,999	15.9%	15.2%
100,000-499,999	13.4%	12.5%
25,000-99,999	17.6%	16.3%
5,000-24,999	20.3%	16.1%
LT 5,000	17.9%	10.1%
Overall	**18.5%**	**13.4%**

Urban/Rural Status		
	Percentage of Connected Libraries	**Percentage of All Libraries**
CC	16.3%	14.1%
NC	14.6%	12.2%
NO	21.1%	13.9%
Overall	**18.5%**	**13.4%**

Urban (CC), suburban (NC), and rural (NO) libraries provide similar access to online CD services at the Main/Central Library, with access ranging from 19.1% to 24.8%. Urban libraries, however, provide the greatest percentage of access to online CD services at the Main/Central Library and All Branches with 17.2%.

A majority of public libraries--70.3%--do not provide public access online reference services, followed by 24.9% that do provide access to such services at the at the Main/Central Library, 3.5% at the Main/Central Library and All Branches, and 1.3% at the Main and Central Library and Some Branches (see Figure 30). In general, as library population of legal service decreases, the provision of online reference services increases at the Main/Central Library. Conversely, as population of legal service area increases, so too does the provision of online reference services at the Main/Central Library and All Branches. Rural (NO) libraries provide the greatest percentage (27.4%) of public access online reference services at the Main/Central Library, whereas urban (CC) libraries provide the greatest percentage (9.5%) of public access online reference services at the Main/Central Library and All Branches.

Few public libraries provide special software/ hardware for individuals with disabilities (see Figure 31). Indeed, only 5.9% provide such services at the Main/Central Library, 3.3% at the Main/Central Library and All Branches, and 1.3% at Main/Central Library and All Branches. As the population of legal service area increases, so too does the provision special software/hardware for individuals with disabilities at the Main/Central Library and the Main/Central Library and All Branches. Urban libraries (CC) provide the greatest access to special software/hardware for individuals with disabilities at the Main/Central Library with 15.4%.

Remote/Dial-In Public Access Services

Overall, 18.5% of connected libraries (13.4% of all public libraries) provide some type of public access remote/dial-in services (see Figure 32). Although readers might assume that urban and/or libraries that serve larger population of legal service areas would be more likely to provide such dial-in services as opposed to rural and/or libraries that serve small population of legal service areas, this is not the case. Libraries that server population of legal service areas of more than one million provide the highest percentage of dial-in services with 26.1%; this is followed by libraries that serve population of legal service areas of 5,000-24,999 with 20.3%, libraries that serve population of legal service areas of less than 5,000 with 17.9%, and libraries that serve population of legal service areas of 25,000-99,999 with 17.6%. Of notable interest is that rural (NO) libraries provide the highest percentage of dial-in access with 21.1%, followed by urban (CC) libraries with 16.3%, and suburban (NC) libraries with 14.6%.

Public Access and Staff Workstations/Terminals

Public libraries provide substantially more graphical workstations than text-based terminals for public Internet access services with 72.9% and 38.2%, respectively (see Figure 33). As indicated, this is an increase of 45.2% for public access graphical workstations, and an increase of 3.7% for public access text-based terminals since 1996. In general, as the population of legal service area increases, so too does the percentage of graphical workstations (range of 69.7% to 88.8%) and text-based terminals (range of 26.0% to 79.4%). Libraries that serve population of legal service areas of greater than one million have the greatest percentage--94.6%--of library staff only workstations/terminals, whereas libraries that serve population of legal service areas of less than 5,000 have the lowest percentage--48.1%--of library staff only workstations/terminals. It is interesting to note that urban (CC), suburban (NC), and rural (NO) libraries have nearly the same percentage of public access graphical workstations (range of 70.4% to 79.1%). There is a marked difference, however, between urban, suburban, and rural library percentages of public access text-based terminals, with 59.4%, 46.9%, and 30.7% respectively. Urban libraries are substantially more likely to provide library staff only workstations/terminals than are rural libraries, with 94.3% and 59.6% respectively.

In terms of average public access terminal or workstation numbers, however, libraries that serve population of legal service areas of greater than 100,000 have considerably more available public access text-based terminals (average number ranging from 42.6 to 218.0) and graphical workstations (average number ranging from 21.7 to 178.0) than do libraries that serve population of legal service areas of less than 100,000 (average number of text-based terminals ranging from 1.0 to 9.9, and average number of graphical workstations ranging from 1.8 to 6.5) (see Figure 34). Also, as public library population of legal service area increases, so too does the average number of library staff only workstations/terminals (range of 2.5 to 135.6). As Figure 34 shows, urban(CC) libraries have the largest average number of workstations and terminals (38.0 terminals and 24.7 workstations), followed by suburban (NC) libraries (12.8 terminals and 5.8 workstations), and rural (NO) libraries (4.1 terminals and 3.0 workstations). Similarly, urban libraries have the most library staff only workstations/ terminals with 31.1, followed by suburban libraries with 10.2, and rural libraries with 4.2.

Public Library World-Wide Web Servers

As Figure 35 indicates, 14.4% of connected public libraries have Web servers, up from 2.8% in 1996. The data clearly show, however, that larger public libraries--those serving population of legal service areas of greater than 100,000--are more likely to have a Web server (range of 44.3% to 67.9%) than are libraries that serve population of legal service areas of under 100,000 (range of 6.5% to 23.8%). Rural (NO)

Figure 33. Type of Public Access and Librarian Terminals by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area						
	% of Connected Libraries with Public Access Text Terminals	% of All Libraries with Public Access Text Terminals	% of Connected Libraries with Public Access Multimedia Terminals	% of All Libraries with Public Access Multimedia Terminals	% of Connected Libraries with Terminals for Library Staff Only	% of All Libraries with Terminals for Library Staff Only
Million +	55.3%	40.0%	83.8%	60.6%	94.6%	68.4%
500,000-999,999	79.4%	57.4%	88.5%	64.0%	93.1%	67.3%
100,000-499,999	59.6%	43.1%	88.8%	64.2%	89.5%	64.7%
25,000-99,999	46.8%	33.8%	71.9%	52.0%	87.5%	63.3%
5,000-24,999	39.9%	28.9%	73.2%	52.9%	74.4%	53.8%
LT 5,000	26.0%	18.8%	69.7%	50.4%	48.1%	34.8%
Overall	**38.2%**	**27.6%**	**72.9%**	**52.7%**	**69.4%**	**50.2%**
Change from 1996	**+3.7%**	**+12.2%**	**+45.2%**	**+40.3%**	**-8.3%**	**24.1%**

Urban/Rural Status						
	% of Connected Libraries with Public Access Text Terminals	% of All Libraries with Public Access Text Terminals	% of Connected Libraries with Public Access Multimedia Terminals	% of All Libraries with Public Access Multimedia Terminals	% of Connected Libraries with Terminals for Library Staff Only	% of All Libraries with Terminals for Library Staff Only
CC	59.4%	42.3%	79.1%	57.2%	94.3%	68.2%
NC	46.9%	33.9%	73.4%	53.1%	81.3%	58.8%
NO	30.7%	22.2%	70.4%	50.9%	59.6%	43.1%

libraries (8.8%) are substantially less likely than Urban (CC) and suburban (NC) libraries (39.8% and 19.0% respectively) to have a Web server. The percentage of libraries maintaining Web servers is up by 10.6% from 1996.

Public Library Ratings of Public Access and Staff Workstations

Public libraries generally disagree that their public access workstations are enough or sufficiently equipped for today's multi-media applications (see Figure 36). Indeed, libraries rate the adequacy of the number of public access workstations with a 3.33 (1=Strongly Agree, 5=Strongly Disagree) and the multi-media capabilities with a 3.40 (1=Strongly Agree,

Figure 34. Number of Library System Public Access and Librarian Terminals by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area			
	Average Number of Public Access Text Terminals	**Average Number of Public Access Multimedia Terminals**	**Average Number of Terminals for Library Staff Only**
Million +	218.0	178.9	135.6
500,000-999,999	110.4	69.2	150.1
100,000-499,999	42.6	21.7	32.6
25,000-99,999	9.9	6.5	9.5
5,000-24,999	4.8	2.8	3.6
LT 5,000	1.0	1.8	2.5
Overall	**14.1**	**5.7**	**9.1**
Change from 1996	**+9.2**	**+3.8**	**3.6**

Urban/Rural Status			
	Average Number of Public Access Text Terminals	**Average Number of Public Access Multimedia Terminals**	**Average Number of Terminals for Library Staff Only**
CC	38.0	24.7	31.1
NC	12.8	5.8	10.2
NO	4.1	3.0	4.2
Overall	**14.1**	**5.7**	**9.1**
There is no 1996 Urban/Rural Status Data.			

Figure 35. Percentage of Libraries that have Web Servers by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	1997		1996	
	Percentage of Libraries Connected to the Internet with Web Servers	Percentage of All Public Libraries with Web Servers	Percentage of Libraries Connected to the Internet with Web Servers	Percentage of All Public Libraries with Web Servers
Million +	63.5%	63.5%	13.0%	10.7%
500,000-999,999	67.9%	66.4%	10.2%	9.5%
100,000-499,999	44.3%	41.5%	8.8%	8.2%
25,000-99,999	23.8%	22.1%	5.0%	3.7%
5,000-24,999	10.5%	8.3%	1.6%	0.7%
LT 5,000	6.5%	3.6%	0.0%	0.0%
Overall	14.4%	10.4%	2.8%	1.2%
Since the Population of Legal Service Area strata in 1996 study were different, some strata have been combined and averaged.				

Urban/Rural Status		
	1997	
	Percentage of Libraries Connected to the Internet with Web servers	Percentage of All Public Libraries with Web Servers
CC	39.8%	34.6%
NC	19.0%	15.9%
NO	8.8%	5.8%
Overall	14.4%	10.4%
There is no 1996 Urban/Rural status data.		

Figure 36. Public Library Ratings of Public Access Technology by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area			
	Patrons have adequate access to terminals/ workstations	**Library staff have adequate access to terminals/ workstations**	**Workstations sufficiently equipped for multimedia requirements**
Million +	2.65	2.08	3.01
500,000-999,999	3.76	2.78	3.39
100,000-499,999	3.18	2.48	3.19
25,000-99,999	3.28	2.33	3.42
5,000-24,999	3.22	2.29	3.63
LT 5,000	3.56	2.19	3.09
Overall	**3.33**	**2.3**	**3.4**

Urban/Rural Status			
	Patrons have adequate access to terminals/ workstations	**Library staff have adequate access to terminals/ workstations**	**Workstations sufficiently equipped for multimedia requirements**
CC	3.17	2.41	3.46
NC	3.26	2.18	3.39
NO	3.41	2.34	3.19
Overall	**3.33**	**2.3**	**3.4**
1=Strongly Agree 5=Strongly Disagree			

5=Strongly Disagree). Libraries, however, indicate that the access that library staff have to workstations is adequate (rating of 2.30, with 1=Strongly Agree, 5=Strongly Disagree). The data show that as the population of legal service area decreases, dissatisfaction with the number of publicly available workstations increases (range of 2.65 to 3.56). In general, the same trend holds true for the sufficiency rating of library technology multimedia capabilities (range of 3.01 to 3.63). Staff access ratings vary, with the data showing no clear trend by population of legal service area.

Figure 36 also indicates that rural (NO) libraries are more likely to be dissatisfied with the number of public access workstations (rating of 3.40) than are urban (CC) and suburban (NC) libraries, with ratings of 3.17 and 3.26 respectively. It is interesting to note, however, that rural libraries rate their public access workstations more highly for multimedia capabilities (rating of 3.19) than do urban (rating of 3.46) and suburban libraries (rating of 3.39). This is perhaps the case due to rural libraries connecting to the Internet more recently than urban and suburban libraries, thus rural libraries would tend to have newer computing equipment.

Public Library Information Technology Costs, Internet Service Costs, and Future Library Connection Resource Allocation

This section presents annual public library IT and Internet cost expenditure data for the last completed fiscal year prior to the mail survey. The data reflect accurate estimates of library-provided IT and Internet expenditures, however, readers should note the following:

- Internet services are often provided via existing library technologies (e.g., OPACS, workstations, and terminals) and libraries cannot therefore attribute all of the OPAC costs to Internet service provision. It is difficult, at best, to separate and/or estimate Internet service provision costs from such installed technologies;

- Not all library-based Internet services are paid for by the libraries. Rather, many libraries receive grants from a variety of sources such as the state library, private corporations, and philanthropic groups. It should also be noted that these grants take a variety of forms, such as equipment, telecommunications services, and software licenses. As such, libraries cannot fully estimate the costs of those services and/or in-kind contributions;

- Related to the above, many libraries benefit from and participate in a wide array of local, regional, or statewide network consortia that generally provide telecommunications and software licensing services. Further complicating this issue is that these consortia often receive financial and other support themselves, and member libraries receive services in a multitude of differing ways. For example, one participating library will receive more telecommunications lines than another, thus making it difficult to determine the average library's real consortia costs.

- Library budget reporting structures and mechanisms do not break out Internet costs. Thus, many respondents contacted the survey team indicating their inability (and, in some cases, unwillingness) to report Internet-specific costs.

These issues prompted the study team to select a small subset of regional and statewide library networks to further explore library Internet cost issues, models, and worksheets. The findings from this effort are presented in Appendix A.

Public Library IT and Internet Costs

Public libraries spent an average of $69,041.91 on all library IT for the last completed fiscal year prior to the survey (see Figure 37). Not surprisingly, the average library IT expenditure increases as the library population of legal service area does (range of $12,491.88 for libraries that serve populations of less than 5,000 to $2,471,624.63 for libraries that serve populations of more than one million). Urban (CC) libraries, however, substantially outspend suburban (NC) and rural (NO) libraries, with average IT expenditures of $350,629.13, $78,214.35, and $26,094.96 respectively (see Figure 37).

Overall, libraries spent an average of 46.5% of their total IT budgets on Internet-related items (see Figure 37). In general, as the library population of legal service area increases, so too does the percentage of IT

Figure 37. Total Average IT Expenditures and Internet Expenditures for Last Completed Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area			
	Average IT Expenditures	**Average Internet Expenditures as a % of Total IT Expenditures**	**Average Internet Expenditures**
Million +	$2,471,624.63	52.9%	$1,307,489.00
500,000-999,999	$1,448,093.37	41.2%	$596,614.00
100,000-499,999	$289,683.00	54.1%	$156,719.00
25,000-99,999	$85,683.00	55.9%	$47,897.00
5,000-24,999	$24,567.38	45.0%	$11,055.00
LT 5,000	$12,491.88	42.0%	$5,247.00
Overall	**$69,041.91**	**46.5%**	**$32,104.00**

Urban/Rural Status			
	Average IT Expenditures	**Average Internet Expenditures as a % of Total IT Expenditures**	**Average Internet Expenditures**
CC	$350,629.13	49.8%	$174,613.00
NC	$78,214.35	49.2%	$38,481.00
NO	$26,094.96	44.6%	$11,638.00
Overall	**$69,041.91**	**46.5%**	**$32,104.00**

budget spent on the Internet (range of 42.0% to 55.9%). These percentages translate into an average library Internet expenditure of $32,104.00, with a range of $5,247.00 to $1,307,489.00. It is interesting to note that the percentage of library Internet expenditure as a percentage of library IT expenditures is relatively constant across urban (CC), suburban (NC), and rural (NO) libraries, with 49.8%, 49.2%, and 44.6% respectively (see Figure 37). In terms of average dollar amounts, however, urban libraries substantially outspend suburban and rural libraries, with average expenditures of $174,613.00, $38,481.00, and $11,638.00 respectively.

The five most costly items for the provision of Internet-related services are system/server hardware with 24.7%, followed by staffing costs with 15.9%, telecommunications fees with 17.8%, communications hardware with 11.1%, and software costs with 10.6% (see Figure 38). Of particular interest is that rural (NO) libraries spend proportionately more on system/server

Figure 38. Internet Cost Data by Category as a Percentage of Overall IT Expenditures by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area										
	System/ Server Hardware	Software Costs	Communi-cations Hardware	Telecommu-nications Fees	Facilities Upgrade Costs	Training and Education Costs	Content/ Resource Development Costs	Program Planning/ Management	Staffing Costs	Maintenance
Million +	27.6%	6.7%	12.3%	8.6%	10.0%	2.7%	2.0%	6.0%	13.5%	13.2%
500,000-999,999	14.7%	9.8%	7.4%	7.7%	2.8%	4.9%	4.0%	2.6%	12.9%	6.4%
100,000-499,999	18.4%	8.4%	9.7%	9.7%	7.0%	6.2%	6.3%	6.3%	16.7%	9.6%
25,000-99,999	26.6%	11.5%	9.4%	13.7%	9.8%	7.3%	8.8%	6.3%	16.0%	8.7%
5,000-24,999	31.4%	11.7%	11.7%	17.0%	7.8%	5.7%	5.4%	2.9%	12.3%	10.2%
LT 5,000	14.7%	8.6%	8.6%	24.6%	14.5%	14.9%	3.8%	5.3%	21.5%	12.7%
Overall	**24.7%**	**10.6%**	**11.1%**	**17.8%**	**10.1%**	**8.8%**	**6.0%**	**4.7%**	**15.9%**	**10.3%**

Urban/Rural Status										
	System/ Server Hardware	Software Costs	Communi-cations Hardware	Telecommu-nications Fees	Facilities Upgrade Costs	Training and Education Costs	Content/ Resource Development Costs	Program Planning/ Management	Staffing Costs	Maintenance
CC	23.4%	8.9%	10.1%	10.7%	6.5%	6.5%	6.2%	5.6%	15.5%	8.4%
NC	30.5%	12.1%	14.1%	14.3%	9.2%	10.2%	5.4%	4.2%	17.3%	12.9%
NO	37.4%	10.0%	9.4%	20.7%	11.4%	8.4%	6.3%	4.9%	15.2%	8.9%
Overall	**24.7%**	**10.6%**	**11.1%**	**17.8%**	**10.1%**	**8.8%**	**6.0%**	**4.7%**	**15.9%**	**10.3%**

Figure 39. Anticipated Internet Expenditures for Hardware Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	36.0%	8.7%	18.7%	36.7%
500,000-999,999	9.6%	22.6%	19.0%	48.8%
100,000-499,999	17.6%	17.5%	21.2%	43.7%
25,000-99,999	21.2%	22.1%	20.8%	35.9%
5,000-24,999	19.3%	25.0%	19.8%	35.8%
LT 5,000	35.7%	31.7%	3.9%	28.6%
Overall	**25.0%**	**26.1%**	**14.8%**	**34.1%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	21.1%	17.0%	23.8%	38.1%
NC	25.2%	19.3%	18.3%	37.3%
NO	27.6%	33.3%	5.6%	33.5%
Overall	**25.0%**	**26.1%**	**14.8%**	**34.1%**

Figure 40. Anticipated Internet Expenditures for Software Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	36.0%	27.3%	18.7%	18.0%
500,000-999,999	6.3%	21.8%	27.8%	44.1%
100,000-499,999	9.7%	28.8%	28.2%	33.3%
25,000-99,999	11.0%	36.2%	23.0%	29.8%
5,000-24,999	10.9%	43.2%	26.8%	19.1%
LT 5,000	19.5%	30.8%	14.6%	35.1%
Overall	**13.7%**	**36.4%**	**22.1%**	**27.8%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	11.8%	23.2%	33.6%	31.3%
NC	11.1%	35.8%	29.7%	23.4%
NO	15.2%	38.5%	16.7%	29.6%
Overall	**13.7%**	**36.4%**	**22.1%**	**27.8%**

Figure 41. Anticipated Internet Expenditures for Communications Hardware Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	57.9%	10.0%	16.2%	15.8%
500,000-999,999	51.7%	13.7%	10.2%	24.3%
100,000-499,999	53.6%	10.5%	13.2%	22.7%
25,000-99,999	54.1%	18.7%	11.1%	16.2%
5,000-24,999	53.8%	18.9%	11.0%	16.3%
LT 5,000	56.4%	24.1%	7.3%	12.3%
Overall	**54.7%**	**19.9%**	**10.0%**	**15.5%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	53.1%	15.0%	13.3%	18.6%
NC	55.4%	17.5%	9.9%	17.2%
NO	54.5%	21.8%	9.6%	14.2%
Overall	**54.7%**	**19.9%**	**10.0%**	**15.5%**

Figure 42. Anticipated Internet Expenditures for Telecommunications Fees for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	13.5%	13.5%	43.8%	29.2%
500,000-999,999	18.5%	15.0%	15.0%	51.6%
100,000-499,999	9.3%	21.3%	28.0%	41.5%
25,000-99,999	6.1%	36.1%	25.1%	32.7%
5,000-24,999	5.4%	41.2%	25.4%	28.1%
LT 5,000	18.4%	35.4%	21.3%	24.8%
Overall	**10.0%**	**36.8%**	**24.2%**	**29.1%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	8.4%	30.4%	26.6%	34.6%
NC	4.5%	31.4%	29.1%	35.0%
NO	13.3%	40.7%	21.0%	24.9%
Overall	**10.0%**	**36.8%**	**24.2%**	**29.1%**

Figure 43. Anticipated Internet Expenditures for Facilities Upgrade Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	14.6%	13.5%	42.7%	29.2%
500,000-999,999	12.6%	33.5%	20.2%	33.7%
100,000-499,999	11.3%	36.9%	18.7%	33.0%
25,000-99,999	16.7%	36.4%	19.9%	27.0%
5,000-24,999	11.5%	42.2%	18.9%	27.4%
LT 5,000	23.8%	34.4%	14.2%	27.5%
Overall	**16.5%**	**38.0%**	**17.7%**	**27.8%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	15.5%	38.4%	22.0%	24.1%
NC	19.9%	31.4%	24.2%	24.4%
NO	14.6%	42.0%	13.1%	30.4%
Overall	**16.5%**	**38.0%**	**17.7%**	**27.8%**

Figure 44. Anticipated Internet Expenditures for Training and Education Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	8.7%	35.3%	28.0%	28.0%
500,000-999,999	0.0%	12.7%	49.7%	37.6%
100,000-499,999	4.0%	28.9%	38.7%	28.4%
25,000-99,999	5.9%	32.8%	34.7%	26.6%
5,000-24,999	3.5%	41.9%	34.3%	20.4%
LT 5,000	5.4%	44.2%	30.1%	20.3%
Overall	4.6%	39.4%	33.5%	22.4%

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	4.0%	27.5%	40.9%	27.6%
NC	3.5%	33.1%	40.2%	23.2%
NO	5.3%	44.4%	29.0%	21.3%
Overall	**4.6%**	**39.4%**	**33.5%**	**22.4%**

Figure 45. Anticipated Internet Expenditures for Content and Resource Development Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	9.5%	29.4%	20.6%	40.5%
500,000-999,999	0.0%	13.9%	44.4%	41.6%
100,000-499,999	3.7%	33.9%	38.8%	23.7%
25,000-99,999	3.1%	39.7%	33.1%	24.1%
5,000-24,999	1.2%	40.3%	35.0%	23.4%
LT 5,000	7.8%	50.8%	25.4%	16.0%
Overall	**3.8%**	**42.5%**	**32.1%**	**21.6%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	4.5%	25.0%	42.5%	28.1%
NC	3.0%	38.7%	37.1%	21.2%
NO	4.2%	47.4%	27.6%	20.8%
Overall	**3.8%**	**42.5%**	**32.1%**	**21.6%**

Figure 46. Anticipated Internet Expenditures for Program Planning and Management Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	21.1%	44.7%	11.4%	22.8%
500,000-999,999	3.7%	55.2%	11.2%	29.9%
100,000-499,999	8.7%	45.7%	25.7%	19.9%
25,000-99,999	8.4%	53.8%	18.9%	18.9%
5,000-24,999	3.8%	62.1%	21.6%	12.5%
LT 5,000	4.2%	46.3%	38.7%	10.8%
Overall	**5.4%**	**54.0%**	**26.5%**	**14.1%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	9.9%	46.4%	25.2%	18.5%
NC	4.0%	58.2%	23.4%	14.3%
NO	5.4%	52.8%	28.4%	13.4%
Overall	**5.4%**	**54.0%**	**26.5%**	**14.1%**

Figure 47. Anticipated Internet Expenditures for Staffing Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	0.0%	15.8%	50.0%	34.2%
500,000-999,999	0.0%	16.8%	48.5%	34.7%
100,000-499,999	3.9%	28.9%	35.8%	31.4%
25,000-99,999	2.1%	34.2%	35.8%	27.9%
5,000-24,999	0.0%	42.8%	30.2%	27.0%
LT 5,000	3.2%	48.2%	38.8%	9.7%
Overall	**1.7%**	**41.3%**	**34.6%**	**22.3%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	2.5%	33.9%	35.7%	27.9%
NC	0.4%	38.7%	33.7%	27.3%
NO	2.3%	43.8%	35.0%	18.8%
Overall	**1.7%**	**41.3%**	**34.6%**	**22.3%**

Figure 48. Anticipated Internet Expenditures for Maintenance Costs for the Next Fiscal Year by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
Million +	0.0%	13.5%	42.7%	43.8%
500,000-999,999	3.5%	21.5%	35.8%	39.1%
100,000-499,999	3.0%	26.3%	40.2%	30.5%
25,000-99,999	3.1%	21.8%	44.6%	30.5%
5,000-24,999	0.8%	28.7%	43.4%	27.2%
LT 5,000	2.9%	50.1%	32.9%	14.1%
Overall	**2.1%**	**33.9%**	**40.0%**	**24.0%**

Urban/Rural Status				
	Decline	**Remain the Same**	**Increase 1-5%**	**Increase More than 5%**
CC	3.4%	23.6%	45.1%	28.0%
NC	1.2%	32.6%	39.8%	26.3%
NO	2.4%	35.8%	39.4%	22.4%
Overall	**2.1%**	**33.9%**	**40.0%**	**24.0%**

hardware (37.4%) and telecommunications fees (20.7%) than do urban (23.4% for system/server hardware and 10.7% for telecommunications fees) and suburban (30.5% for system/server hardware and 14.3% for telecommunications fees) libraries.

Anticipated Public Library Internet Costs

Figures 39-48 present library estimates for anticipated Internet expenditures for the fiscal year following the survey. Libraries indicated their anticipated Internet expenditures with the following: Decline, Remain the Same, Increase 1-5%, or Increase More than 5%. By totaling the Increase 1-5% and Increase More than 5% categories, it is clear that libraries expect increases in nearly all cost categories. Libraries expect their maintenance costs to increase the most with 64.0% indicating an increase (see Figure 48), followed by 56.9% for staffing costs (see Figure 47), 55.9% for training and education costs (see Figure 44), 53.7% for content and resource development (see Figure 45), 53.3% for telecommunications fees (see Figure 42), 49.9% for software costs (see Figure 40), 48.9% for hardware costs (see Figure 39), 45.5% for

facilities upgrade costs (see Figure 43), 40.6% for program planning and management costs (see Figure 46), and 25.5% for communications hardware costs (see Figure 41).

As these figures indicate, public libraries of all population of legal service area and Urban/Rural categories will continue to invest in Internet-related technologies to enable electronic networked services.

Internet Costs Not Paid by Libraries

The survey pre-tests and research conducted by the authors indicated that not all public libraries pay for some and/or all of their library's Internet services. As such, the survey asked libraries to indicate Internet costs for which they incurred no costs and to estimate the market value of those donated items and/or services. Readers should note that these contributions can take multiple forms such as donated equipment (e.g., workstations, routers), telecommunications services (e.g., telecommunications lines, Internet accounts), statewide licensing agreements (e.g., Dialog, Carl Uncover), and grants (e.g., monies for equipment, special content development projects). Moreover, libraries do not necessarily receive funding for all of a particular cost category. More often than not, libraries receive some type of matched-funding for a variety of cost categories, thus the percentages presented in Figure 49 likely represent portions of Internet costs not paid for by libraries, rather than absolute costs not paid for by libraries.

As Figure 49 indicates, the five most frequent costs not paid by libraries are system/server hardware with 29.5%, followed by software costs with 26.4%, communications hardware costs with 25.9%, training and education costs with 14.0%, and program planning and management costs with 12.0%. The data indicate a clear trend with a higher percentage of libraries that serve population of legal service areas of under 100,000 not paying for Internet-related cost items as opposed to libraries that serve population of legal service areas of over 100,000.

For libraries that serve population of legal service areas of under 100,000, the costs not paid for by libraries for system/server hardware ranges from 22.2% to 42.0%, as opposed to libraries that serve population of legal service areas of over 100,000 with a range of 0.0% to 14.8%; for libraries that serve population of legal service areas of under 100,000, the costs not paid for by libraries for software ranges from 21.2% to 30.0% as opposed to libraries that serve population of legal service areas of over 100,000 with a range of 0.0% to 10.3%; for libraries that serve population of legal service areas of under 100,000, the costs not paid for by libraries for communications hardware costs ranges from 24.5% to 28.4% as opposed to libraries that serve population of legal service areas of over 100,000 with a range of 0.0% to 14.7%; for libraries that serve population of legal service areas of under 100,000, the costs not paid for by libraries for training and education costs ranges from 11.8% to 16.0% as opposed to libraries that serve population of legal service areas of over 100,000 with a range of 0.0% to 5.2%; and for libraries that serve population of legal service areas of under 100,000, the costs not paid for by libraries for program planning and management costs ranges from 10.8% to 14.1% as opposed to libraries that serve population of legal service areas of over 100,000 with a range of 0.0% to 5.2% (see Figure 49).

Also of particular interest is that rural (NO) libraries receive substantially more assistance for their Internet services than do urban (CC) and suburban (NC) libraries (see Figure 49). Rural libraries do not pay for 37.4% of their system/server hardware costs, 33.3% of software costs, 30.3% of communications hardware costs, 16.8% of training and education costs, and 14.5% of program and planning management costs. Clearly, rural libraries receive substantial assistance with Internet connection hardware and software--assistance targeted to provide rural libraries with basic Internet capabilities.

As Figure 50 indicates, the average library Internet cost not paid for by libraries is $9,877.69. As the population of legal service area increases so too does the average estimated dollar amount of costs not paid by libraries. Furthermore, urban (CC) libraries receive an average of $22,166.52 in Internet support, followed by $12,501.57 for suburban (NC) libraries, and $7,562.99 for rural (NO) libraries.

Figure 49. Percentage of Costs Not Paid by Library by Population of Legal Service Area and Urban/Rural Status.

	Population of Legal Service Area										
	System/ Server Hardware	Software Costs	Communi-cations Hardware	Telecommu-nications Fees	Facilities Upgrade Costs	Training and Education Costs	Content/ Resource Development Costs	Program Planning/ Management	Staffing Costs	Maintenance	Other
Million +	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
500,000-999,999	6.6%	11.2%	9.2%	7.0%	2.0%	4.3%	2.3%	2.3%	4.7%	2.3%	2.2%
100,000-499,999	14.8%	10.3%	14.7%	7.4%	10.8%	5.2%	7.8%	5.2%	4.2%	7.2%	2.1%
25,000-99,999	22.2%	21.2%	24.5%	12.0%	9.4%	11.8%	10.9%	12.2%	8.6%	8.7%	0.4%
5,000-24,999	25.6%	29.0%	28.4%	13.6%	12.2%	16.0%	13.6%	14.1%	8.1%	11.3%	1.0%
LT 5,000	42.0%	30.0%	26.2%	10.5%	10.9%	14.9%	10.2%	10.8%	9.6%	11.2%	0.0%
Overall	**29.5%**	**26.4%**	**25.9%**	**11.8%**	**11.0%**	**14.0%**	**11.5%**	**12.0%**	**8.4%**	**10.4%**	**0.6%**

	Urban/Rural Status										
	System/ Server Hardware	Software Costs	Communi-cations Hardware	Telecommu-nications Fees	Facilities Upgrade Costs	Training and Education Costs	Content/ Resource Development Costs	Program Planning/ Management	Staffing Costs	Maintenance	Other
CC	15.2%	12.2%	18.1%	9.0%	7.4%	7.1%	6.2%	8.2%	4.7%	5.9%	4.5%
NC	18.8%	17.5%	19.7%	10.0%	9.9%	10.5%	9.4%	8.4%	6.7%	9.8%	0.4%
NO	37.4%	33.3%	30.3%	13.1%	12.0%	16.8%	13.3%	14.5%	9.8%	11.2%	0.3%
Overall	**29.5%**	**26.4%**	**25.9%**	**11.8%**	**11.0%**	**14.0%**	**11.5%**	**12.0%**	**8.4%**	**10.4%**	**0.6%**

Figure 50. Average Internet Costs Not Paid by Libraries by Population of Legal Service Area and Urban/Rural Status.

Population of Legal Service Area	
	Average Internet Costs Not Paid by Library
Million +	$20,300.00
500,000-999,999	$79,700.00
100,000-499,999	$34,974.70
25,000-99,999	$16,871.21
5,000-24,999	$6,126.61
LT 5,000	$5,301.17
Overall	**$9,877.69**

Urban/Rural Status	
	Average Internet Costs Not Paid by Library
CC	$22,166.52
NC	$12,501.57
NO	$7,562.99
Overall	**$9,877.69**

SUMMARY

The 1997 study of public library Internet use, involvement, and cost shows that libraries are connecting rapidly to the Internet, are providing public access to the Internet, and are increasingly offering electronic network services to patrons.

The study also shows, however, that the distribution of Internet connectivity, costs, and service provision is not equal across library population of legal service areas or urban/rural status. Indeed, libraries that serve population of legal service areas of more than 5,000, and are in urban (CC) and suburban (NC) areas, are much more likely to be connected to the Internet than are libraries that serve population of legal service areas of under 5,000 and are in rural (NO) areas (see Figure 7). Thus, individuals that live in a rural area and are served by a small library (about 44.3% of all public library systems, according to NCES (1997) data), are not likely to have access to a public library that provides Internet-based services.

It is important to note that public libraries will continue to connect to the Internet and increasingly provide public access Internet services. Indeed, by May 1998, approximately 86% of public library systems will have an Internet connection (see Figure 9). Moreover, those library systems will serve approx-imately 97% of the U.S. population (see Figure 10). Thus, the libraries that do not plan to connect, which are most likely to be rural, small (see Figure 8), and serve a small portion of the U.S. population.

On the surface the connectivity statistics are impressive. Readers, however, should note that libraries generally disagree, across all population of legal service areas and Urban/Rural categories, that their public access Internet services are adequate (see Figure 36). In particular, libraries indicate that patrons do not have adequate access to public access workstations and that those workstations are not sufficiently equipped for today's multimedia requirements.

While the public library Internet connectivity percentages are impressive, libraries that do have Internet connections use predominantly dial-up technology to connect to the Internet (see Figure 11). Although a majority of public libraries do provide graphical access to the Internet (see Figures 13 and 33), most do so over a single dedicated phone line at rates of 33.6kbps or less (a majority--49%--at 28.8kbps) (see Figure 14). For libraries that do have leased-lines, a majority--56%--still use 56kbps lines (see Figure 17). While 27% of public libraries do have T1 lines, discussions with survey respondents and author experience in other studies, indicate that most of the T1 lines are fractional, with 56kbps lines connecting library system branches to the main library's services. Thus, readers should not be surprised when responding libraries rate their Internet connections as somewhat inadequate (see Figure 20).

Costs for library Internet services range from 5% to 25% of public library IT expenditures (see Figure 38). This translates into approximately $5,247 to $1,307,489 per year in Internet-related costs, with an average annual expenditure of $32,104 (see Figure 37). Overall, libraries anticipate that their Internet-related expenditures will increase over the next year (see Figures 39-48). It is important to note, however, that libraries that serve population of legal service areas of under 100,000 and are in rural (NO) areas do not pay for a significant portion of their Internet-related system hardware, communications hardware, and software costs (see Figures 49-50). These libraries, therefore, report little to no Internet costs. But, clearly, someone is paying for such services either in part or in total. Appendix A further discusses the complexity related to identifying library Internet-related costs.

Given the current policy environment of universal service and LSTA, these findings raise difficult questions that policy makers, library professionals, and researchers need to consider for public library Internet service provision:

- What is Universal Service in the networked environment? Is it:
  - Connectivity?
  - Not just connectivity, but a certain level of connectivity?
  - Services provision over the network?
  - A combination of a certain level of connectivity and a level of services provision?
- Given the percentage/anticipated percentage of library Internet connectivity, has universal service been achieved for public libraries?
- What measures are necessary to assess, evaluate, and improve public library electronic networked services?

Answers to such questions are not easy to derive. Careful consideration of these, and other, questions is necessary to inform policy makers and library professionals as to the best means possible to facilitate the ongoing transition of public libraries into the electronic networked environment.

FUTURE DATA NEEDS

This report provides policy makers, library professionals, and researchers with previously unavailable and longitudinal data concerning public library involvement with and use of the Internet. These data serve a variety of pur-poses, including providing baseline library connectivity, connection and cost data, as well as information on connectivity and connection progress.

The study, however, has its limitations. It is necessary to expand both the types of data collected and the entities from which the data are collected. For example, the study collected Internet-related data from public library *sys-tems*, not branches. While only approximately 16.3% of public library systems have branches (NCES, 1997), those systems that do have bran-ches represent significant demographic characteristics and population sizes that need further study. Such libraries--Los Angeles Public Library, New York Public Library, Chicago Public Library, to name a few--serve large U.S. population segments of varied socioeconomic backgrounds. While the study indicates that

these library *systems* have some type of Inter-net connection, the study does not provide data concerning the percentage of system *branches* that have Internet connections or the type of Internet connection(s) within those branches. Moreover, no data are available that correlate various population demographics (e.g., poverty) to branch connectivity.

NCLIS, ALA, the Gates Library Foundation, and other groups indicate an interest in such additional data collection. These data are critical to assisting policy makers, library professionals, and funding agencies to:

- Determine the critical needs areas for electronic network funding;
- Measure the impact of various net-working funding efforts (e.g., USF, Gates Library Foundation grants); and
- Inform the policy debate for future networking funding initiatives.

A collaborative data collection effort among federal and state library agencies (e.g., IMLS, NCLIS, and state libraries), library professional organizations (e.g., ALA), and other funding organizations (e.g., Gates Library Foundation <http://www.glf.org>) is necessary to pool limited resources and begin laying the foundation for ongoing and additional public library electronic network-related studies.

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APPENDIX A

INTERNET COST MODELS FOR PUBLIC LIBRARY NETWORKS

INTRODUCTION

The initial analysis of data from the *1997 ALA/NCLIS Survey of Public Library Internet Use* indicated some difficulties in the data collection specific to survey questions 16 and 17 (see Appendix B):

- Of the total library expenditures for all information technologies reported in question 15, please compute/estimate the percentage spent on providing Internet-related services for staff and patrons for the last completed fiscal year and estimate the amount of increase or decrease you anticipate for the next fiscal year for these costs.

- If your library pays for some or none of the Internet costs in question 16, please compute/ estimate the total fair market dollar amount of these costs paid by others.

Public libraries had considerable difficulty in responding to these questions if they were part of a larger regional or statewide public library network through which they received Internet-related services. Many individual public libraries did not have access to these parent organization budgets and thus, could not answer questions 16 and 17 of the survey. The survey sample did not account for the role of regional and statewide public library networks in supporting local libraries' Internet access. Since a major intent of the survey is to capture Internet-related costs to public libraries, it became important to better identify, define, and understand these costs related to public library networks.

It was not surprising that public libraries could not, in many instances, provide data relating to Internet costs. This issue constituted a major finding in a study of Internet cost models and public libraries, *Internet Costs and Cost Models for Public Library Internet Use* (McClure, Bertot, and Beachboard, 1995). That study found that while many public libraries reported they were connected to the Internet, the libraries could not identify and describe specific costs for providing Internet-related services. Other public libraries indicated that connecting to the Internet was a goal, but they were uncertain as to what types of expenditures this would involve.

This inability to predict Internet-related costs was a major stumbling block to many libraries that were not

connected as it made any planning efforts difficult if not impossible. But the 1995 study also pointed out that while cost accounting was a stumbling block, the public libraries saw the need to develop a methodology that would capture Internet-related expenditures. The study noted that "cost factors were extremely important to determining the public libraries' connectivity to the Internet." (p. 1). At stake here is the larger issue of the role of public libraries in the National Information Infrastructure, with which the cost data is integrally aligned.

Thus, the study team proposed and developed a case study to obtain additional cost data to better understand cost categories and actual costs. Severe time constraints limited the data that were reasonable to collect and the number of public library networks that could be included in the case study. The purpose of the case study was to provide additional descriptive data of cost variables relevant to statewide and regional public library networks to better define these cost variables in a number of different networking environments.

The preliminary response to the 1997 survey reinforced the difficult nature of this task. It is not unusual to experience ambiguity and uncertainty whenever trying to capture initial costs of a new technology (Caudle, et al. 1989; Fletcher et al, 1992). This does not however, make that process futile. Rather, it argues for the immediacy of such a task in establishing standards at an early stage of diffusion to better track costs incurred and to plan for future development. While the 1995 study made note of the significant difficulties public libraries had in attempting to define cost categories and provide cost data for Internet-related services, it did identify a preliminary model for cost categories. This preliminary cost model added to the knowledge base of cost information for Internet connectivity for public libraries. The goal of this current study is to build upon that knowledge base, using the preliminary cost model as a starting point to better capture accurate and valid cost data related to Internet connectivity.

METHODOLOGY

The effort to explore and identify library Internet costs required the use of multiple methods. This section details the methodologies used by the study team to further determine library-related Internet costs with a selected set of libraries and library systems representative of existing Internet connectivity models --statewide, regional, and individual library systems.

Research Questions

The case study portion of the research is a supplement to the *1997 ALA/NCLIS Survey of Public Library Internet Use*. The study team developed the following set of research questions to better understand the degree to which public libraries received subsidized allocations from statewide and regional pubic library networks to provide Internet services (survey questions, 16 and 17):

- What are the specific network-related costs that are paid for by statewide and regional public library networks?
- Is it possible to develop a preliminary generic cost worksheet that would capture these costs across a range of statewide and regional public library networks?
- What are the major areas of concern to be addressed in developing a generic cost worksheet that would have utility for all statewide and regional public library networks?

In addition to these specific questions, the study team used this opportunity to gather data on statewide and regional public library network configurations and Internet-related services. This secondary data analysis serves to provide a broader picture of the relationship of these networks to public libraries in provision of Internet access.

Preliminary Cost Model

The authors developed a preliminary cost worksheet which was taken directly from the worksheet presented in the *Internet Costs and Cost Models for Public Libraries* (McClure et al., 1995). The study team assessed this cost worksheet for its utility and currency to the Internet environment of 1997. A number of the line items were developed based on changes in network technologies since the time of the original worksheet. Data obtained from the 1996 *Public Libraries and the Internet* study (Bertot, McClure, and Zweizig, 1996) and other projects in which the authors were involved (Bertot and McClure, 1996; McClure and Bertot, 1997) further informed the cost model revisions.

The study team added a new category--telecommunications lines to the Internet--to the pre-test version of the cost worksheet. Line items added to this category included dial-up and leased lines for added

detail. The original cost worksheet section of "software" was expanded to include Web page expenditures and software for people with disabilities. The original "content/resources development" category came under revision to reflect the electronic nature of content and resources that the study team wanted to capture.

This revised version of the original cost worksheet became the instrument for the pre-test portion of the case study. The pre-test asked case study participants to evaluate the usability of the revised cost model and to make changes to categories and line items as they saw fit. Three iterations of this process were conducted to produce a "final" version of the cost model to use for the case study.

Data Collection

The study team collected data from July 10, 1997 through August 27, 1997. The team developed a case study methodology for the collection of data and employed a variety of data collection techniques to answer the research questions. Initially, the study team reviewed preliminary survey data reported in the *1997 ALA/NCLIS Survey of Public Library Internet Use*. In specific, an analysis of survey questions 16 and 17 framed the collection of data from the case participants. This analysis included discussion of key variables with case study participants and the Advisory Board to the study team.

In addition, the study team reviewed the data from the above-mentioned cost model study sponsored by the U.S. National Commission on Libraries and Information Science (NCLIS) (McClure, Bertot and Beachboard, 1995). The cost worksheet developed for that research became the basis for cost worksheet development in this case study.

The study team modified the cost worksheet to reflect subsequent changes in information technology to better capture a number of different expense items. Once the initial cost worksheet was revised and finalized, a timeline was developed for collecting the data. As this portion of the larger study emerged from preliminary data analysis of the survey, time was a limiting factor in the data collection effort. The survey portion of the study was originally scheduled to be completed by May 23, 1997. The study team extended this deadline to allow for greater participation from the public library sample. There remained, however, an overall timeline for completion of the study that did not allow for significant deviation. Thus, the case study needed to be completed within a six week timeframe.

The study team contacted potential case study participants by e-mail and fax to introduce this portion of the study and solicit their interest and willingness to participate. Four of the original nine sites contacted were unable to participate due to the severe time constraints.

The remaining five participant sites were first asked to pre-test the revised cost worksheet. Their comments were used in further revisions to the worksheet and in the development of specific interview questions which would elicit responses to the research questions posed above. The study team finalized the questions and faxed them to all participants on August 5, 1997. The fax contained a cover letter (see Appendix A.1) with specific requests for information and the fourth iteration of the cost worksheet for their analysis.

At this stage of the research, the study team determined that it would not be possible for any one public library network to use some standard cost worksheet to capture their Internet-related costs. The discussions held with the participants during the pre-testing of the cost worksheet indicated that rather than having one standard cost worksheet, multiple versions of such a worksheet would be necessary, tailored to the budget processes used in the various jurisdictions. Instead of developing multiple worksheets to try to accommodate local differences, and then having the case study participants fill in the cost data for these, the study team asked the participants to respond to four questions pertaining to the current revised cost worksheet. The participants received a deadline of August 15, 1997 in which to respond to the research questions either by phone, fax or e-mail. Along with this set of interview questions was a list of documents deemed relevant to collect for the research. The case study participants were requested to submit any documents relating to their network configurations, information architectures, network policies, and listing of network services.

The study team, in the development of this portion of the larger study, used accepted techniques and methods for the development of the research design and data collection and analysis activities (Creswell, 1994; Denzin and Lincoln, 1994; Marshall and Rossman, 1995). The study team used specific strategies to insure the reliability and validity of the data collected. It is

important to note that the small size of this case study does not lend itself to generalizing the results reported here. Rather, the data should be viewed as a preliminary attempt to describe the range of issues and factors confronting statewide and regional public library networks when public libraries attempt to accurately cost their Internet services.

Case Study Participants

The study team first reviewed the preliminary returns of the *1997 ALA/NCLIS Survey of Public Library Internet Use* to determine if certain statewide or regional public library networks were identified. The study team then conducted a search on the Internet to identify statewide and regional public library networks using the following URLs:

<http://sunsite.berkeley.edu/libweb/usa-pub.html>; <http://rio.atlantic.net/~bdarl/library.html.plibrary>; <http://sjcpl.lib.in.us/homepage/PublicLibraries/PublicLibraryServers.html>).

The study team was able to obtain descriptions of these networks from a search of their Internet addresses. This gave the study team a preliminary list of potential case study participants.

The study team established the following criteria to identify appropriate statewide and regional public library networks for participation in the case study:

- Variation in technological infrastructure to incorporate networks with a range of connectivity and system/server configurations, e.g., network typology, backbone type, multimedia;
- Variation in content and service provision through the network, e.g., on-line databases, e-mail, on-line reference; and
- Willingness and ability to provide the requested data in the time frame specified and to interact with the study team in developing a preliminary baseline description for statewide and regional public library network cost model issues.

In all, the study team collected data from three regional public library networks and two statewide public library networks.

The study team used the following techniques to collect data:

- Telephone interviews with the network directors to determine the feasibility of completing the iterative versions of the cost model;
- Telephone and e-mail interviews with the network directors to ascertain the issues involved in costing and defining those costs for Internet services; and
- Documentation from the statewide and regional public library networks to assess the network configurations and services currently offered.

This combination of data collection techniques enabled the study team to obtain as rich a picture as possible from a range of networks within a limited timeframe. The various data collection techniques were useful in informing the revisions to the original cost worksheet sent to the participants. In all, the study team revised the cost worksheet (Appendix A.2) three times in response to feedback from the case study participants. In addition, the study team developed a glossary (Appendix A.3) based on requests for information from the participants to clarify the line items on the cost worksheet.

Data Analysis

At various points in the case study, the study team reviewed the participants' comments for the purpose of revising the cost worksheet and further articulating the data needed to answer the research questions. At the end of the second round of comments from the participants on the feasibility of completing the cost worksheet for their network and on the usefulness of the cost worksheet to capturing their Internet expenditures, the study team revised its goal of collecting statewide and regional public library network cost data by having each participant complete a cost worksheet. The feedback from the case study parti-cipants indicated that due to the complex and diverse nature of their networks, budgeting methods particular to each site, and other differences in service range, no one cost worksheet would be adequate to meet the needs of all statewide and regional public library networks.

Based on this feedback, the study team prepared a "final" version of the cost worksheet for the parti-

cipants. The participants were requested to respond to a subset of questions directed towards understanding the overall issues of costing out their network services in connection with the use of the final version of the cost worksheet.

The participants submitted their responses via e-mail, fax and telephone interviews which were, in turn, analyzed for content issues. Documentation about costs and configurations accompanied this data and was content analyzed to supplement the interview data. It should be noted that not all respondents provided data for every data collection request. Thus the analysis of the data reflects the responses received that will not in all cases add up to five.

STATE AND REGIONAL PUBLIC LIBRARY NETWORK COST WORKSHEETS

The data presented here come from the pre-test of the cost worksheet, phone interviews about cost worksheet issues, and a set of questions sent to all participants to ascertain the following:

- The three most difficult issues in completing the current version of the cost worksheet;
- The amount of time estimated in person-hours required to complete the cost worksheet;
- The modifications needed to be made to make the cost worksheet relevant to their particular network situation; and
- The annual cost data for the network, per year, since the inception of the network.

Below are the issues and results study participants provided concerning the worksheet.

The Cost Worksheet

Case study participants received initial cost worksheets to pretest for usefulness and clarity. Their comments, reported here, were incorporated in to changes made to the worksheet. This final version of the worksheet was then re-sent to the participants to assess its applicability and utility.

An overall theme from the respondents was that the expenditures could not be broken down as neatly as the cost worksheet assumes. The major problems with the pre-test version of the cost worksheet included the inability to:

- Distinguish central site from remote site expenditures in a number of line items;
- Distinguish between LAN and WAN expenditures;
- Designate proportion of staff time related to Internet services;
- Indicate costs that might be double-counted due to the manner in which they were labeled;
- Determine what exactly was being requested due to lack of operational definition; and
- Distinguish between different options network members may have in Internet access.

The study team took these comments into account and revised the pre-test version of the cost worksheet to a version that more accurately represented the budget concerns of the participants. The "staff" category, section 8 on the cost worksheet, was significantly revised to enable respondents to indicate multiple and unique staff lines including a section to "check-off" the staff participation in training, help functions, planning, and content development functions.

The "no-cost item" category, section 9 of the worksheet was revised and simplified to enable respondents to merely indicate if they received any of the named resources rather than requiring them to attempt to cost out the value of these items. Another direction taken by the study team was to develop a glossary of operational definitions for the line items as suggested by the respondents. This glossary accompanied the revised cost worksheet in the final round of data collection.

Most Difficult Issues

The case study participants defined the three most difficult issues they faced in completing the latest version of the cost worksheet given their divergent network configurations, budget methods, and services. A major theme noted by the participants was the difficulty in defining what, exactly, was a network. There was no common understanding of what constitutes a network and this made completion of *any*

type of cost worksheet problematic. A related issue here is the rapidly changing network technology and policy environment. This lack of stability makes defining and tracking costs again, problematic. Participants repeatedly noted that the transitional nature of the network environment was a barrier to accounting.

The difference between the cost worksheet and the accounting systems used by different jurisdictions was another noted difficulty. To make the cost worksheet viable, one respondent commented that she would have to set up a separate spreadsheet to capture the expenditures listed on the cost worksheet, and another spreadsheet to capture the expenditures as required by their budget and accounting system policies.

Another noted difficulty was the problem of tracking shared resources or "free" resources in terms of both costs and quantity. The respondents stated that a number of the expenditures on the cost worksheet are not used solely for the network, but are also included in other library services, e.g., consolidated telephone bills are not amenable to calculating the long distance charges directly attributable to Internet activities. Another example of a shared resource was software where the license was for multiple simultaneous users, not all of whom used it for Internet activities. In some cases, resources, e.g., equipment and staff, are shared with other agencies and would be impossible to determine how much should be charged to one agency versus another. A good portion of such information was "not available, not predictable, and not under my control."

One respondent noted that the accounting practice used by the library network is to aggregate some of these items and that other cost items are shared in such a manner that makes their documentation difficult. Among the most common expenses that are paid out of other funds or provided by other agencies are software licenses, telephone lines, Internet access, workstations and servers. Some networks receive these items as "in kind" contributions, others are bundled with other services, and still others are purchased and/or maintained by parent organizations.

Respondents noted further that a number of the line items on the cost worksheet were irrelevant as the items represented one-time costs for the network that had already been expended. In one instance, the library network purchases workstations on a staggered basis, with 25 percent of all workstations replaced each year. Participants commented that tracking some of these expenditures over time would not be a useful process.

An important consideration to note is that the cost worksheets are political by their very nature. Introducing and acknowledging this element of "politicalness" makes problematic the completion of any worksheet. Actual expenditures for technologies are often (purposefully) embedded in other cost categories and reporting these costs might better stay hidden. Budgets are political tools and cost categories become the vehicle for the playing out of political agendas in an agency. The expenditures noted in any budget say more than a dollar value. They reflect choices, philosophies, and policy, along with alliances and compromises made to further the goals of an agency. These implicit variables are subtle, and forcing them to become explicit is not only futile but foolhardy in the eyes of agency executives.

A final concern noted relates to the fact that the network infrastructures of the participants cover a range of installations and agencies, e.g., member libraries, state library agencies, county governments, consortia, and the state or regional network orga-nization. This multiple cost structure makes it difficult to provide cost data. To do so would require that the member libraries each fill out a cost worksheet and submit it to the parent network organization. Respon-dents noted the difficulty they would have in estimating the expenditures of these network items for their member libraries.

An additional complication here is that the member libraries do not solely use the infrastructure for Internet access. Other uses are made of the infrastructure, including automated circulation, inter-library loan, and public access to databases. Attempting to factor out these other services would be, if not impossible then, very difficult and may not generate accurate cost estimates. A final complication occurs where other agencies "bill" the state or regional network for services which the networks cannot directly contract, such as voice or data telecommunications. In these instances, the billing does not correlate with any of the cost categories on the cost worksheet.

Time to Complete the Worksheet

There was a wide range in the estimates given for the time it would take to complete the cost worksheet as received. One respondent stated that she "hadn't a clue" and even if she did, for reasons mentioned above

in the "difficult issues" section, the information would not be meaningful to their network. Other responses ranged from six to eight hours; eight to ten hours; and twenty-four to thirty-two hours of time. It is important to note here the comment from some of the respondents that regardless of the time allotted to completing this cost worksheet, they were unsure from the start that they could obtain the required data.

The "twenty-four to thirty-two hours" response was from one of the statewide public library networks. The respondent further noted that even if they standardized the administration of this cost worksheet for their statewide public library network, that lengthy amount of time would not likely be reduced. The respondent noted further that even given the thirty-two hour time frame, the cost worksheet would still be incomplete as some of the data requested on it could not be provided due to the extensive amount of additional time it would require to extract that information.

Another issue raised here is that some of the participants remained unconvinced of the value of determining the costs given the effort required to capture them. It is important to raise this concern of effort versus value. One respondent pointed to the extreme level of detail requested in the cost worksheet, and wondered how important it was to have separate cost data for line items such as routers, modems, number of PCs, or operating systems.

Cost Worksheet Modifications

There were a range of responses to the request to provide suggestions to make the cost worksheet more useful to each participant's network. In the case of the smaller regional public library networks, the responses concerning modifications were not drastic. One respondent noted that few modifications were needed as they would be able to fill in the worksheet fairly easily as it stood. Another regional public library network noted that most of the modifications they would require were in Section 2, "Telecommunications Lines Out to Internet". Here they would need to expand the line items to better reflect their specific telecommunications infrastructure which enables all their member libraries (43) to connect to the Internet.

One respondent made the comment that it was too early in the Internet era to talk about modifying the cost worksheet as the situation right now is too dynamic for any one stable document to capture. The number and type of Internet-related services is expected to change. Pending and future policy decisions will change how cost information is captured, and what cost information will be tracked. The resolution of the FCC's telecommunications discounts will also affect what and how they track cost data (see the FCC's website for additional background <http://www.fcc.gov>).

A respondent from one of the statewide public library networks provided a number of cogent and detailed comments to the request for suggestions to modify the cost worksheet. First, she noted that the revised cost worksheet had considerably more clarity than did previous versions. The "personnel" section was mentioned in that it now asked for a doable and sufficient level of detail for which to provide costs. A suggestion was made to reinstate the "travel" line back into the worksheet with a recommendation to place it under Section 7, "Grant/Program Development". The study team deleted the travel line along with the other Personnel lines (staff training, user training, documentation development, on-going user support) after comments from the pre-test indicated that this level of specificity was difficult to provide given the sharing of personnel resources and the volatility of the current personnel environment.

One respondent went on to note that to make more detailed modifications to the current cost worksheet might not be appropriate for other public library networks as the accounting system they used might not be transferable to other jurisdictions. One suggestion to ameliorate this concern would be to collapse some of the line items to reflect a broader level of detail, rather than the fine level of granularity the cost worksheet currently attempts to capture. Suggestions made included combining LAN hubs, routers, modems and transceivers in Section 3 of the worksheet, and combining a number of the software costs as the level of detail in section four seemed like "overkill." A suggestion made for Section 6, "Electronic Content", concerned the issue of Web-based content versus all electronic resources a library might offer. The respondent noted that further clarity in this section would be useful to ascertain if the line items reflected only Web-based services or all electronic services.

Annual Cost Data

As anticipated, it was very difficult for the case study participants to provide the annual cost data since the inception of their networks. A number of the respondents were unable to provide any data for a variety of reasons. A common theme heard here was

the problem presented with overlapping staff functions. Library staff in many instances were not dedicated full-time to Internet-related work making it very problematic to calculate percentage of time and cost to their various functions. Another difficulty the case study participants had was in the inability to calculate the dollar amount that their "free" access or equipment represented. Some Internet connections were provided through other venues which absorbed the cost and thus, the public library networks would not have an actual dollar amount to report.

An additional concern raised is the recency of costing out network expenditures as separate from the more traditional information services function. One statewide public library network participant noted that prior to Fiscal Year 1996 their Network Service program was not a separate organizational budget code for them. Supplies, printing, training costs, and general personnel expenditures had been mixed in with the Information Services budget. This type of budgeting is not unusual for the other case study participants, as noted in their recurrent comments on not being able to cost out from their general budgets these Internet-related expenses.

Where dollar amounts were provided by participants, there was an expected range of annual costs. The size of the networks, the range of services, and the limitations expressed about capturing many of these expenses account for the differing aggregate costs. One regional public library network provided an annual network cost estimate of $150,000 - $200,000. Another regional respondent gave $862,000 as a 1996 actual amount. One of the statewide respondents provided a figure of $1,167,008 for expenditures to date since the inception of the network in 1992. The 1996 expenses provided by this network totaled $372,234.

In two cases, the participants did provide a level of detail of expenditures over the network life. The participants did note that what they provided was problematic in that their budget methods tracked different and in some cases cross-functional budget line items so what they submitted reflected their'best effort to break out the cost. Their worksheets are presented in Figures A.1 and A.2.

There is an inherent difficulty in understanding of these cost estimates. An estimate provided by a regional network is low due to the large amount of in-kind, shared, and "free" services they receive from other organizations. In other cases, start-up expenditures or one-time expenditures can artificially inflate a cost estimate. These issues, coupled with the uncertainty the respondents had in interpreting the cost worksheet line items, make any estimates tenuous at best.

Summary of Cost Model Issues

There are some major and recurring themes relating to the usefulness of the cost worksheet at this time in the development of public library networks. First, the fact that public libraries are in a transition phase with network development, use, technology, and policy makes accounting for a routinized subset of expenses all but impossible. Until such time as this environment stabilizes, the development of any one standard cost worksheet is not useful. But the development of individual cost worksheets reflective of a jurisdictions budget and accounting procedures is useful and necessary to track current Internet-related expenditures and to plan for future Internet development by public libraries.

Another concern for cost modeling is the vastly differing nature of how the statewide and regional pubic library networks budget. Line items, accounting codes, and tracking procedures differ significantly from jurisdiction to jurisdiction. This makes standardization a challenge.

A third issue is the inability to cost out those expenses that are shared over multiple library programs

Figure A-1. Internet Annual Cost Data for a Statewide Public Library Network.

CATEGORY	1992	1993	1994	1995	1996	1997*
PERSONNEL	xxx	xxx	xxx	xxx	$ 147,177.00	$ 88,147.00
TRAVEL	$ 3,449.21	$ 29.70	$ 6,647.21	$ 1,047.70	$ 925.31	$ 1,941.61
TELEPHONE/INTERNET CONNECTIONS	$ 109.95	$ 1,170.00	$ 32.80	$ 1,182.42	$ 1,672.16	$ 9,262.00
CONSULTING/PROFESSIONAL SERVICES	$ 2,710.00	$ 9,000.00	$ 57,982.15	$ 78,707.00	$ 108,960.34	$ 3,439.00
GRANTS	$ 14,240.00	$ 13,270.00	$ 34,671.00	$ 174,717.00	$ 10,876.00	$ 60,628.07
OPERATING SUPPLIES	xxx	$ 15.75	$ 69.40	$ 120.10	$ 87.13	$ 82.57
OFFICE FURNITURE	xxx	xxx	$ 1,408.46	xxx	$ 1,234.62	xxx
PRINTING SERVICES	xxx	xxx	$ 2,450.63	xxx	xxx	$ 146.42
TRAINING MANUALS/EDUCATIONAL SUPPLIES	$ 600.00	xxx	$ 935.11	$ 250.00	xxx	xxx
TRAINING COSTS	xxx	xxx	$ 159.60	$ 5,250.00	$ 1,445.00	$ 300.00
DP HARDWARE	xxx	xxx	$ 53,012.81	$ 21,600.00	$ 95,649.85	$ 14,103.36
DP SOFTWARE	xxx	xxx	$ 29,105.00	$ 90,404.60	$ 4,215.15	xxx
SP SUPPLIES	xxx	xxx	$ 2,517.60	$ 850.00	xxx	xxx
TOTALS:	**$ 21,109.16**	**$ 23,495.45**	**$ 188,911.77**	**$ 374,128.82**	**$ 372,243.04**	**$ 187,050.75**

* JANUARY-JUNE ONLY

Figure A-2. Internet Annual Cost data for a Regional Public Library Network.

CATEGORY		1995 000's	1996 000's	1997 000's
COUNTY:	OPERATING*		126	129
	CAPITAL		205	50
	PERSONNEL		111	218
LIBRARY**	OPERATING	114	111	118
	CAPITAL		327	20
TOTAL		114	880	535

*Costs of PC hardware, software, networking and technical support for all county offices
**Represents only thoses figures that were immediately available

Personnel represents 5.1 FTE's in 1996 and 6 FTE's in 1997

1996 County Capital represents DRA integrated system upgrade to 450 user licences plus an addition of three modules of hte application

1997 County Capital represents purchase of third party reporting tool

1996 Library Capital represents major upgrade of DEC hardware to dual cluster Alpha servers, DEC 800 line prointer, authority control clean-up of entire database, DRA utility to extract MAEC records for CD-ROM

1997 Library Capital represents purchase and installation of central site frame relay equipment; two T1 lines

or bundled with related services. Because of the idiosyncratic nature of how each network allocates and tracks resources, it is a challenge to determine what portion of a resource is actually an Internet cost versus a circulation cost or an administrative cost, for example. The fact that these resources are often shared over multiple programs, and not dedicated solely to Internet use, makes accounting for the resources an inaccurate science. But without any reasonable estimates of these costs, planning, rationalizing, and accounting for Internet-related services will suffer from a lack of justification.

STATE AND REGIONAL PUBLIC LIBRARY NETWORK INTERNET CONFIGURATIONS AND SERVICES

As an addendum to the cost model portion of the case study, the study team requested additional documentation from the participants that described the configuration of their network and the services their network provided. Any existing network architectures or blueprints, and any description of services provided by their networks were also requested by the study team. As with the cost worksheet portion of the case study, the participants' ability to respond to this secondary request ranged from the provision of actual blueprints to comments reflecting the respondents'

awareness of the importance of such a document and their lament that, at this time, they did not have such.

Regional Public Library Networks

The scope of each regional network varied:

- 3 counties with 45 member libraries;
- 1 county with 34 municipal public libraries and the county library; and
- 1 county with 6 regional libraries.

The frame relay network utilized by the three regional networks can support speeds from 56 kbps to 1,544 mbps. Both networks are ethernet with Cisco 7000 or x.25 routers.

One network has been offering dial-up access to the Internet through terminals in the public libraries or through 16 dial-in lines since 1993. A second regional network initiated Internet access in March, 1997, via a 10 workstation computer lab. Netscape and Internet Explorer are the main Internet browsers used. Although Lynx is also offered for a text-based Internet component at one of the regional networks.

The regional networks offer a range of services at their web sites. One of the regional networks offers local community and government information and use of periodical and newspaper databases. Another makes available a variety of software tools, e.g., Word, Excel, and Power Point, Encarta 97 Encyclopedia and World Atlas, a database of full text articles and images from periodicals, newspapers, directories, handbooks, and the like, as well as many multimedia and interactive databases. Internet training - beginning and advanced - is an additional service for the library patrons one of the regional networks. All three regional networks have their library catalogs on the web.

An interesting feature of the Internet-related services is the partnering which describes some of these ventures. Through a "Libraries Online" grant, one of the regional networks created the "Power Up Place." This computer lab is a cooperative effort of the Microsoft Corporation, the American Library Association and the Technology Resources Institute. Another partnership noted is between one of the regional networks, a regional Internet service provider, and a private training company to offer "affordable, user-friendly Internet classes" for library patrons.

A third partnering arrangement occurred between one of the regional library networks and Bellcore for the purpose of investigating public access to the Internet. A pilot project was launched to determine public and institutional use of the Internet with a study group of 200 library staff and 174 library patrons. The project ended in August, 1995 with the private sector involvement terminating. The library staff and patrons chose to continue the Internet access after seeing the value of it as an information resource.

Only one regional network provided data on governance of their Internet-related services. They are governed by a 14 member, elected, Planning Council. The members are composed of 12 library directors plus two county employees, the County Librarian and the Chair of the Department of Community and Special Services. The Planning Council, in turn, reports to the County Freeholders on network services and issues.

Statewide Public Library Networks

It is difficult to summarize the scope and services offered by the two statewide public library networks here and capture the full flavor of what they do and how they do it. Much of the information presented here came from their web sites, supplemented by press releases, articles from periodicals, and information obtained from email communications with the library directors. Each statewide public library network will be reported on individually.

The first statewide network officially began with a state legislature appropriation in 1992. The appropriation provided $50,000 for one-time networking activities by public libraries. Eight pilot sites were chosen for the initial funding. Since that time, with additional appropriations from the state legislature, 44 libraries serving approximately 90 percent of the state population have begun network activities.

Other activities initiated by the state library include:

- The development of an online electronic library with links to IAC's SearchBank and two state newspapers. The electronic library is available to all public, school, and academic libraries in the state and to state agencies;

- The development and implementation of a comprehensive training program for Internet use;
- The connection of more than 70 public library sites to the Internet;
- The development of a Web site in 1994 to organize Internet information resources; and
- The development of a listserv for all public library personnel and trustees to facilitate communication among the statewide network participants.

This statewide public library network was a 1995 National Information Infrastructure Award winner, and is a nominee for a Service Application award from the National Association of State Information Resources Executives.

The second statewide public library network was proposed in 1994 to the state's Information resources management Commission. The stated goal was to:

> provide all of the state's citizens equal and unimpeded access to extensive libraries, leading research facilities, government agencies, powerful computing centers, and a wide-range of government and private services. Librarians are already playing a key role in enabling citizens to access information through electronic networks. As the sources proliferate and the technology becomes increasingly complex, librarians will continue to expand their role in assisting users to cope with a sophisticated technical infrastructure, discover vital information resources, and take advantage of the many applications available for locating and retrieving information. The establishment of a Network Information Center by the State Library embodies this expanded role for librarians.

A web site was developed with information resources relating to genealogy, state government documents, state newspapers, statistics, and public libraries on the web. Email is provided for public library staff statewide as are some listservs. Training in Internet-related skills and consulting for technical assistance are also provided to the public libraries.

It is clear in examining these differing services that public library networks are still testing the waters on the Internet. The networks made clear their desire to assist the public in accessing the best information resources through a variety of network activities. These activities are still being thought of and developed and will continue to emerge as new creative and productive ideas evolve.

SUMMARY

It is clear from the results of the case study that capturing costs and developing services on the Internet is akin to the PC revolution in the early 1980s. Here was a fantastic new technology that brought the power of information to the desktop. Yet, the full capabilities of the technology were unknown, and the effective capture of the cost and cost savings was not obvious. The emerging public library networks are in somewhat the same state in regards to Internet costs and services. What is missing from this scenario is the fragmentation of data and organizational functions that were an unintended by-product of PC use. The public library networks, rather than enabling a pell-mell development of Internet related services, are facilitating a unified and cogent approach to developing an Internet agenda for their regions and states.

A major conclusion from this case study is the finding that making any kind of cost comparisons across public libraries at this point in time is problematic. There are no obvious consistencies in how public libraries track budget expenses, nor are there any standard budget codes being used across libraries. This is partly a function of the nascency of the Internet, and partly a function of the idiosyncratic budget processes used across differing jurisdictions.

The case study findings demonstrate the difficulties related to identifying, describing, and defining cost data and categories related to public library use of the Internet in a networked environment. These difficulties, do not, however, ameliorate the importance and usefulness of such data for local planning and for national policy making related to the role of public libraries in the NII. Indeed, an important contribution of this study is increasing the awareness of such difficulties and issues associated with identifying, describing, and defining Internet-related costs for public libraries. Public libraries need to develop their own mechanisms to capture their Internet-related expenditures. As the services and contingencies associated with the Internet become more evolved, it becomes expeditious to cost and account for these. The obvious role of the budget in a planning process also

necessitates that public libraries become more capable in capturing these costs.

The cost worksheets developed from the case study can be used by public libraries and their networks as a first step in identifying, describing, and defining costs and cost categories at their individual libraries. The worksheets can be modified by individual libraries, statewide and regional networks to better meet their needs and situational conditions. While the study team concludes that collecting such data is still difficult, the effort is no less important and libraries should continue to experiment with ways to collect and define such data. Indeed, the process of individualizing the worksheet to a particular library or library network will provide significant insights for staff at that library about Internet-related costs.

For individual libraries attempting to modify the worksheet developed here, the study team would suggest that it is better to have estimates of networking costs based on the best information available than to have no cost data available. Thus, continued work in this area from both local libraries and researchers is needed to develop more accurate and explanatory models of Internet costs for public libraries. Such research must be continued and expanded -- especially in the context of better understanding the linkages between Internet costs and Internet services provision. While standardized worksheets appropriate for a range of public libraries and networks may not be possible at this time, it is possible for individual libraries to identify, describe, and define costs that make sense for them, in their particular situation.

Moreover, describing and defining Internet related costs will become increasingly important as libraries continue to increase the range of services provided via the network. Public libraries need to become more aware of how to manage the integrated nature of the information and communications technologies when assessing their infrastructure. As many respondents' noted, costs are often embedded in more than one function, which currently makes accounting difficult. A more "information resources management" approach might help to better allocate the various costs to Internet-related services. This also holds for accounting for Internet-related resources that are "in-kind' or "free." Somewhere there is a cost for these and a better attention to defining this cost will give a more valid picture of total Internet-related expenses. All these costs need to be integrated into the overall costing and budgeting process of the library through its Management Information System (MIS) or its Decision Support System (DSS). Regardless of the approach taken, comprehensive management of library costs is essential for successful planning and evaluation of library services.

To a large degree, public librarians, researchers, and policy makers do not understand the linkages between Internet costs and the quality and type of Internet services that can be provided given a specific level of costs. Clearly, low bandwidth will limit the types of networked services that can be provided by a library. But the degree to which other cost factors directly affect quality and type of service provision is unclear. Costing Internet-based services and comparing such services costs to the more traditional services costs will continue to be an important area for future research.

The study also indicates the importance of resource sharing as a means for reducing overall networking costs on an individual library basis. In fact, the success of such efforts is indicative in the inability of libraries and the networks to be able to parse out specific Internet-related costs. But evidence from this study suggests that there are important economies of scale for those libraries participating in statewide or regional/local networks in lowering overall Internet costs. A better understanding of these economies of scale is essential for "next steps" and innovative models for statewide and regional resource sharing.

Internet-related costs for public libraries are likely to increase as a percentage of the overall library expenditures in the near-term. Thus, issues of identifying, describing, and defining those costs are not likely to go away any time soon. The worksheets and suggestions offered in this portion of the *1997 Public Libraries and the Internet* study can provide libraries and policy makers with a good first step in how to best go about estimating those costs. Such estimates will be essential in managing networked library services and insuring that the services provided in this networked environment best meet the needs of the users of these services.

There is the necessity to capture Internet-related costs as they pertain to a performance-based environment. Until the costs can be adequately captured, evaluations will not be able to be tied to program expenditures. The will of the electorate is reflected today in the mandate for performance-based results from government agencies. This initiative transcends

sector in its applicability. Performance-based results are directly tied to budget appropriations, thus, the need to focus on Internet-related costs and their requisite services.

The scope and levels of Internet-based services are evolving at different paces across the public library networks. The advanced and exemplary state of some of these networks provides public libraries with strong role models, thus discouraging the tendency to reinvent the wheel yet again with the Internet. Experiences with costing, partnering, funding, training, development, and services should be shared across public libraries to foster best practices and organizational learning. The wide variation in network membership, range, and scope, rather than being a disadvantage in providing one standard framework, makes possible the development of Internet-related services applicable to a diverse public library network environment.

Finally, it is important to note that the issues pertaining to costing Internet-related services are not for the sole purpose of efficiency. It has recently been suggested that rather than being cost reducers, the information and communications technologies actually involve rather large capital outlays and have non-trivial maintenance costs. Relying on information technology to trim budgets may not make the best case for such expenditures nor is it realistic. Start-up costs for the Internet can be large, but should not be daunting. The effectiveness measures that can be associated with theses costs make a better case for public library involvement with the Internet. This new channel can enable public libraries to extend their reach to potential patrons, and increase their range of services. The information they can access, provide, filter, and otherwise add value to can only be enhanced by creative use of the Internet. This creative use will in turn help to define the evolving role of the public library in an information age.

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APPENDIX A.1

NETWORK PARTICIPANT LETTER

August 5, 1997

Dear Case Study Participants:

We have spent the last few weeks revising the initial cost worksheet based on your comments and suggestions. After in-depth discussions and e-mails with several of you, however, we have decided to modify substantially the approach to the cost worksheet.

Our initial goal was to collect statewide and regional network Internet cost data to supplement the public library-reported Internet cost data for the 1997 Public Library and the Internet survey sponsored by the American Library Association (ALA) and the National Commission on Libraries and Information Science (NCLIS). To do this, we selected networks that provided a range of services through a variety of network configurations.

The feedback you provided us indicated that, due to the nature of your networks, current budgeting methods, and a host of other issues, no one cost worksheet would adequately meet our needs. While we anticipated that there may be a need for multiple worksheets, we did not anticipate the extent to which this would be so. Rather than have you complete the attached revised worksheet, therefore, we are asking you to tell us:

- The three most difficult issues for completing the current worksheet, given your network's configuration, budgeting practices, etc.;
- The amount of time - in person hours - you estimate it would take to complete a similar worksheet;
- The modifications you would need to make to the worksheet to make it work in your state or regional network situation; and
- The gross annual cost data, if possible, for your network since your network's inception.

We will also collect from you documentation that describes the configuration of your network and the services your network provides. Please send us any existing network architectures or blueprints, and any description of services provided by your network.

From this, we will create one or more cost worksheets to include in the 1997 study's final report for public libraries to use in determining the costs of their Internet services. The idea is to provide a starting point for libraries to determine these costs with a worksheet that will require modification to their specific situations.

We thank you for all your assistance to date. Your input has been of great help to us. We hope that you will provide us with feedback on the attached cost worksheet, and any network configuration and service-related documentation by **Friday, August 15**, 1997 for inclusion in the final report. Should you have any questions, please contact Pattee Fletcher <fletcher@umbc.edu>, (410) 455 3154 Phone; (410) 455-1073 Fax.

Sincerely,

John Carlo Bertot, Ph.D.
Assistant Professor

APPENDIX A.2

COST WORKSHEET GLOSSARY

Cost Categories and Elements

System/Server Hardware
The physical technology required to maintain an Internet-based network, mount content, and run services. Such items include workstations, servers, printers and scanners.

Telecommunication Lines Out to the Internet
There are two types of connections to the Internet: Dial-up Connections and Leased-Line Connections. Dial-up connections use telephone lines (analog or digital) and a modem to connect (dial) computers to the Internet. Line connections are dedicated data lines that connect computers to the Internet.

Communications Hardware/Fees
The equipment and services necessary to maintain an Internet connection for dial-up and leased-lines. Such equipment includes modems for connecting a computer via a phone line and routers for connecting a computer via a dedicated leased-line.

In addition, Internet connectivity requires a library/network service to have an Internet account provided by an Internet Service Provider (ISP). Note: in some cases, Internet accounts are donated by the ISP. If this is the case, please put that in section 9 of the worksheet, *No-cost Items*).

Software
Using the Internet requires the acquisition and maintenance of a variety of software programs. The clients and servers must be running some type of network operating system (e.g., Windows NT, Novell Netware). To browse the World Wide Web (Web), users will need navigation software (e.g., Netscape, Internet Explorer, Lynx, etc.). If the library is placing content on the Internet via web pages, they may use a software tool that assists them in creating HTML, such as Microsoft FrontPage, or others. For running Web sites, web server software such as Webstar is necessary. If a specific software package will be utilized on many computers on a network, it maybe necessary to purchase site licenses; this would be indicated by the *Annual Recurring* column. A library also might decide to have special software to assist people with disabilities.

Facilities Upgrades and Maintenance
Depending on the age, adequacy, and capabilities of the facilities that will house the library's/network service's Internet technologies, the facilities may require little to substantial renovations to support adequate Internet connectivity and programs. Such renovations may include adding phone lines, cabling, air conditioning suitable for computer systems, additional power supply, space, office equipment and furniture.

Electronic Content/Resource Services
A wide variety of commercial Internet-based services are now available (e.g., OCLC Firs Search, Carl Uncover). Such services, as well as others, are also available via CD-ROM. In addition, Library and network services provide on-line reference assistance such as e-mail responses to questions. This section seeks to identify the costs associated with those electronic services being offered by libraries and network services.

Grant/Program Development
In the process of establishing and maintaining a network connection, libraries/network services may engage in several planning and assistance-oriented activities. These include strategic planning, securing the services of strategic planners or other outside consultants, and providing innovation or start-up connectivity grants for libraries to connect to the Internet or develop special Internet-based content. Such costs are reflected in this section.

Staff
Some of the areas on which staff traditionally spend their time on include content development, network administration, training, helping others, planning, and resource development. In many cases, staff perform more than one of those tasks, and it may not be possible to break down their time into specific task areas. Please check one or more of the responsibilities that apply to the specific staff positions.

No-Cost Items
Many public libraries collaborate with a variety of local, state, and national institutions through which libraries receive numerous Internet-related items without direct cost to the library/network service. For example, a public library may receive e-mail accounts from a local university. In other cases, the county/state information services department may house and maintain library computer systems at no cost to the library. It is important to identify the existence of these gifts/services, although it may not be possible to accurately reflect the market value of such gifts/services

APPENDIX A.3

COST WORKSHEET

Cost Worksheet for the ALA/NCLIS Study-Current Fiscal Year

COST CATEGORIES AND ELEMENTS

	Quantity	Unit Price	One-time	Annual Recurring
1 **System/Server Hardware**				
Multimedia workstations (PC or MAC)				
Servers (PC, Mac, Unix, Commercial)				
Printers				
Scanners				
Special hardware for people with disabilities				
Other (please specify):				
2 **Telecommunications Lines out to the Internet**				
2.1 **Dial-up (phone lines)**				
28.8K (bits per second)				
33.6K (bits per second)				
56K (bits per second)				
64K bits per second (ISDN 1B + D)				
128K bits per second (ISDN 2B + D)				
Cable service (10 million bits per second)				
Other (please specify):				
2.2 **Leased-Line**				
56K (bits per second)				
ISDN 1B +D --64K (bits per second)				
ISDN 2B + D--128K (bits per second)				
T1 (1.5 million bits per second)				
T3 (45 million bits per second)				
Contracted				
(contracted/purchased through state/other agencies)				
Other (please specify):				

Cost Worksheet for the ALA/NCLIS Study-Current Fiscal Year

		Quantity	Unit Price	One-time	Annual Recurring
3	**Communications Hardware/Fees**				
	Routers				
	Modems				
	Telephone Lines (including toll charges)				
	LAN hubs and transceivers				
	Internet Provider Fees				
	Other (please specify):				
4	**Software**				
	Operating Systems (e.g. Novell Netware, Windows NT)				
	OPAC Gateway (e.g. Dynex Internet Gateway)				
	Navigation (FTP, Telnet, Gopher, WWW Clients)				
	Web Page development software (MS Frontpage, etc.)				
	Web Site management software (e.g. Webstar)				
	Special software for people with disabilities				
	Other				
5	**Facilities Upgrades/Maintenance**				
	Air-conditioning				
	Cabling/wiring				
	Building renovation				
	(training rooms, work areas)				
	Office Equipment (e.g. chairs, desks)				
	Other (please specify):				
6	**Electronic Content/Resource Services**				
	On-line database services (e.g. OCLC FirstSearch, Uncover)				
	On-line CD services (e.g. Encarta, Census Data)				
	On-line reference services				
	(e.g. e-mail reference questions and answers)				
	Other (please specify):				

87

Cost Worksheet for the ALA/NCLIS Study-Current Fiscal Year

7 **Grant/Program Development**		
Strategic Planning (exclusive of staff time)		
Consultant Fees		
Internet Access Grants (total, if applicable)		
Other (please specify):		

8 **Staff**

	Primary Duties:	Salary:	Additional Duties/responsibilities:				
			Training	Help	Planning	Resource/Content Development	Other
Staff Title 1:			( )	( )	( )	( )	( )
Staff Title 2:			( )	( )	( )	( )	( )
Staff Title 3:			( )	( )	( )	( )	( )
Staff Title 4:			( )	( )	( )	( )	( )
Staff Title 5:			( )	( )	( )	( )	( )
Staff Title 6:			( )	( )	( )	( )	( )
Staff Title 7:			( )	( )	( )	( )	( )
Other (please specify):							

9 **No-Cost Items** (items given to your organization at no cost)

	Yes	No
Email accounts	( )	( )
Hardware	( )	( )
Software	( )	( )
Systems maintenance	( )	( )
Communications	( )	( )
Training and Education	( )	( )
Program Planning	( )	( )
Consultants	( )	( )
Facilities Upgrade	( )	( )
Other (please specify):	( )	( )

88

107

108

Cost Worksheet for the ALA/NCLIS Study-Current Fiscal Year

Summary Costs

System/Server Hardware		
Telecommunications Lines		
Communications Hardware/Fees		
Software		
Training and Education		
Facilities Upgrades/Maintenance		
Electronic Content/Resource Services		
Program Planning/Management/Staffing		
No-Cost Items		
	One-time	Recurring
Total one-time and annual recurring costs		

68

109

110

APPENDIX B

1997 INTERNET SURVEY INSTRUMENT AND LETTERS

Survey of Public Library Internet Use

Instructions: The American Library Association and the National Commission on Libraries and Information Science are conducting this survey about your library's level of involvement with or use of the Internet. Your responses will equip national, state, and local decision-makers with a better understanding of Internet use in public libraries. Thank you for your participation! **PLEASE RETURN YOUR QUESTIONNAIRE BY MAY 23, 1997.**

For questions concerning the survey, contact:
John Carlo Bertot
Department of Information Systems
University of Maryland Baltimore County (410) 455-3883 phone
1000 Hilltop Circle (410) 455-1073 fax
Baltimore, MD 21250 <bertot@umbc.edu> e-mail

If your library is not now using Internet, please fill out questions 1 through 6 and return. If your library is connected to the Internet, please complete the entire survey.

PART A: General Library Information and Internet Connection Issues

To be completed by the library director

1. Name of person responding: _____ Title: _____

2. Total paid staff in FTE: _____ FTEs

3. What were the **total library operating expenditures** for the last completed fiscal year? $_____

4. Is your library **currently connected to the Internet** in any way?

   ❑ YES **(please complete questions 6 through 17)** → If yes, when did your library ***first*** **establish** its Internet connection? _____ mm/yr
   ❑ NO **(please complete questions 5 & 6 and return)**

5. If your library **does not now have** any access to the Internet, does your library **plan to connect to the Internet** in any way in the next 12 months? **(CHECK [✓] ONE ONLY)**

   ❑ YES, for library staff use only ❑ NO Internet connection planned in the next 12 months
   ❑ YES, for library staff use AND public access

6. Please assess the degree to which the following possible factors affect your library's **current level of Internet use: (PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)**

	Very Important				Very Unimportant
a) Costs of system/server hardware (*e.g., workstations, terminals, servers*)	1	2	3	4	5
b) Costs of software (*e.g., operating systems--Unix, Windows NT -- applications software--WordPerfect*)	1	2	3	4	5
c) Costs of communications hardware (*e.g., routers, modems*)	1	2	3	4	5
d) Cost of telecommunications fees (*e.g., long distance charges, leased lines*)	1	2	3	4	5
e) Costs of training and education (*for staff and users*)	1	2	3	4	5
f) Costs of content/resource development (*e.g., special collections development, Web home page development*)	1	2	3	4	5
g) Costs of facilities upgrades (*e.g., wiring, air conditioning*)	1	2	3	4	5
h) Costs of staffing (*e.g., FTEs dedicated to management/ maintenance of IT*)	1	2	3	4	5
i) Costs of Internet connection maintenance (*e.g., equipment repairs, equipment maintenance*)	1	2	3	4	5
j) Access to reliable telecommunications services	1	2	3	4	5
k) Availability of state/other telecommunications services (*e.g., statewide backbone such as Sailor, regional backbone such as CLEVNET*)	1	2	3	4	5
l) Availability of in-house computer technical expertise	1	2	3	4	5
m) Availability of staff time to develop expertise on the Internet	1	2	3	4	5
n) Availability of federal/state money	1	2	3	4	5
o) Digital copyright fees	1	2	3	4	5
p) Concern over access to objectionable material	1	2	3	4	5
q) Other (*please specify*):	1	2	3	4	5

_____

PART B: Library Internet Connection Issues

To be completed by the library director or library employee with most knowledge of the library's Internet connection and technology

7. Name of person responding: _____ Title: _____

   Internet e-mail address: _____

8. If applicable, please describe the **type, number, AND cost** of the **dial-up connection** to the Internet your library has (***e.g., for the library to connect to the Internet***):

Library Dial-Up Connection (CHECK [✓] ALL THAT APPLY)
❑ None
❑ Terminal access (***e.g., via text only [non-graphical] access***)
❑ Internet gateway access (***e.g., via commercial on-line provider such as America Online & CompuServe***)
❑ Workstation PPP (Point to Point Protocol) access
❑ Other (***please specify***): _____

→

Speed of Library Connection (CHECK [✓] ALL THAT APPLY)	# of Lines	Annual Cost per Line
❑ 14.4K (bits per second) or less ❑ 28.8K (bits per second) ❑ 33.6K (bits per second) ❑ 56K (bits per second)		$
❑ 64K (bits per second) (ISDN 1B+D)		$
❑ 128K (bits per second) (ISDN 2B+D)		$
❑ Cable service (10 million bits per second)		$
❑ Other (***please specify***): _____		$

9. If applicable, please describe the **type, number, AND cost** of your library's **leased-line connection** to the Internet (***e.g., frame relay, ISDN***):

Library Leased Line (CHECK [✓] ALL THAT APPLY)
❑ None
❑ On-line Public Access Catalog (OPAC) gateway
❑ Local Area Network (LAN) access
❑ Wide Area Network (WAN) access
❑ Other (***please specify***): _____

→

Speed of Library Connection (CHECK [✓] ALL THAT APPLY)	# of Lines	Annual Cost per Line
❑ 56 K (bits per second)		$
❑ ISDN 1B+D -- 64K (bits per second)		$
❑ ISDN 2B+D -- 128K (bits per second)		$
❑ T1 (1.5 million bits per second)		$
❑ T3 (45 million bits per second)		$
❑ Other (***please specify***): _____		$

10. For the next year, how would you rate the **adequacy of your library's Internet connection** in meeting the library's needs along the following criteria: **(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)**

	Very Adequate				Very Inadequate
a) Accessing multi-media information (***e.g., full motion video, sound, images***)	1	2	3	4	5
b) Sufficient bandwidth (***e.g., speed of connection - 56k, T1, etc.***)	1	2	3	4	5
c) Local Area Network capabilities (***e.g., speed, capacity***)	1	2	3	4	5
d) Accessing reliable Internet service providers	1	2	3	4	5
e) Availability of public access Internet workstations	1	2	3	4	5
f) Other (***please specify***): _____	1	2	3	4	5

PART C: Public Access Issues

To be completed by the library director or library employee with most knowledge of the library's public access Internet services

11. Please indicate whether your library **provides patrons the following types of Internet services: (CHECK [✓] ALL THAT APPLY).** **NOTE:** If your library system does not have a main/central library, please check the ***Main/Central Library and ALL or SOME Branches*** options to indicate whether the Internet services are provided in all or some of the library system's branches.

	No	Yes			
INTERNET SERVICE		**At Main/ Central Library ONLY**	**At Main/ Central Library and ALL Branches**	**At Main/ Central Library and SOME Branches**	**Remote /Dial-in Service**
E-mail account services					
Access to newsgroup services					
Access to FTP (file transfer protocol) or Telnet services					
Text-based World Wide Web browsing (***e.g., Lynx***)					
Graphical World Wide Web browsing (***e.g., Netscape, Mosaic, MS Explorer***)					
On-line database services (***e.g., Dialog, Uncover***)					
On-line CD services (***e.g., Encarta, Census data***)					
On-line reference services (***e.g., e-mail reference questions and answers***)					
Special software/hardware for individuals with disabilities					
Other: (***please specify***) _____					

12. Please describe **the type** AND **number** of your **library system's** public access terminals: **(CHECK [✓] ALL THAT APPLY)**

- ❑ Terminals with text-based interfaces (***e.g., VT-100 terminals, PCs/compatibles or Macs with terminal emulation software***) _____ Number of terminals
- ❑ Workstations with graphical interfaces (***e.g., Windows PCs or Macs***) _____ Number of workstations

➡ Are there additional terminals/workstations **just for library staff access**? ❑ Yes ❑ No
If yes, how many? _____ Number of terminals/workstations

13. Given the type and number of Internet **public and library staff access terminals** you described in question 12, please identify the extent to which you agree with the following statements: **(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)**

	Strongly Agree				Strongly Disagree
a) Our library's **patrons** have adequate access to terminals/ workstations (***e.g., 10 minutes or less waiting for access to a terminal/workstation***)	1	2	3	4	5
b) Our **library staff** have adequate access to terminals/ workstations (***e.g., 10 minutes or less waiting for access to a terminal/workstation***)	1	2	3	4	5
c) Our library's public access workstations are sufficiently equipped for today's multi-media requirements (***e.g., sufficient memory, hard disk storage, sound capabilities***)	1	2	3	4	5

14. If your library operates a web server, please provide the web server's (s) URL:

http://_____

PART D: Internet Service Cost Issues

To be completed by the library director or library employee with most knowledge of the library's Internet connection and technology costs

15. Please review the library's **TOTAL expenditures** for the **last completed fiscal year** (include all operating, capital, and other sources) and then **compute/estimate** the total amount of expenditures for **ALL information technologies** (IT) for the **last completed fiscal year** (e.g., hardware/software costs, OPAC /CD-ROM subscription fees, telecommunication costs, training, staffing, etc.):

Total Library IT Expenditures: $_____

16. Of the **total library expenditures for all information technologies** (IT) reported in question 15, please **compute/estimate** the percentage spent on providing **Internet-related services** for staff and patrons for the **last completed fiscal year** AND **estimate** the amount of increase or decrease you anticipate for the next fiscal year for these Internet costs: **(PLEASE COMPLETE FOR EACH ROW)**

Internet Cost Category	% of IT Expenditures for Cost Category	Cost Not Paid by Library (CHECK [✓])	Anticipated Internet Expenditure for Next Fiscal Year (CHECK [✓] ONE ONLY)			
			Decline	Remain Same	Increase 1-5%	Increase >5%
a) System/server hardware costs (*e.g., workstations, servers*)	%					
b) Software costs (*e.g., operating systems-- Unix -- applications software -- Netscape, Word*)	%					
c) Communications hardware (*e.g., routers, modems*)	%					
d) Telecommunications fees (*e.g., long distance charges, leased lines*)	%					
e) Facilities upgrade costs (*e.g., wiring, air conditioning*)	%					
f) Training and education costs (*for staff and users*)	%					
g) Content/resource development costs (*e.g., special collections development, Web page development*)	%					
h) Program planning/management (*e.g., RFP development/analysis*)	%					
i) Staffing costs (*e.g., FTEs dedicated to management/maintenance of IT*)	%					
j) Maintenance for all the above (*e.g., equipment repairs, servicing*)	%					
k) Other (*please specify*): _____	%					
% OF TOTAL IT EXPENDITURES FOR INTERNET (will not total to 100%, as this is the total % of the expenditures devoted to Internet identified in question 15)	%					

17. If your library pays for some or none of the Internet costs in question 16, please **compute/estimate** the total fair market dollar amount of these costs paid by others:

Total Library Internet Expenditures Not Paid by Library: $_____

Thank you for your participation! Please return the survey in the enclosed stamped envelope

SURVEY OF PUBLIC LIBRARY INTERNET USE
University of Maryland Baltimore County
Department of Information Systems
1000 Hilltop Circle
Baltimore, Maryland 21250

First Class Mail

NOTICE:
SURVEY
ALERT FOR THE
LIBRARY
DIRECTOR

Dear Library Director: April 1997

The **American Library Association** and the **National Commission on Libraries and Information Science** are conducting a national survey of **public library Internet use.** John Carlo Bertot and Charles R. McClure are co-principal investigators for the study.

This study builds and expands upon the **Commission's** 1994-1996 studies of public library Internet use and costs. The results from the study will provide critical information that charts the 1994-1997 changes in public library Internet connectivity, IT architecture, and costs, and will address issues related to Universal Service.

Your library has been selected to be in the sample drawn by the National Center for Education Statistics. The survey will be mailed in early May and will ask for a response by the end of the month.

It is extremely important that your library respond, whether or not your library is presently using the Internet. If you have any questions or have not received your survey by May 7, please contact:

John Carlo Bertot
SURVEY OF PUBLIC LIBRARY INTERNET USE
University of Maryland Baltimore County — Phone: (410) 455-3883
Department of Information Systems — Fax: (410) 455-1073
1000 Hilltop Circle — email: bertot@umbc.edu
Baltimore, Maryland 21250

THANK YOU FOR YOU HELP!

U.S. National Commission on Libraries and Information Science
1110 Vermont Ave., N.W., Suite 820
Washington, D.C. 20005-3522
202-606-9200/fax 202-606-9203
http://www.nclis.gov/

ALAAmericanLibraryAssociation
Office for Information Technology Policy
1301 Pennsylvania Ave., N.W., Suite 403
Washington, D.C. 20004-1701
202-628-8421/fax 202-628-8424
http://www.ala.org/oitp/

4 June 1997

Dear Public Library Director:

The American Library Association and the National Commission on Libraries and Information Science are conducting a national survey of public library Internet use. John Carlo Bertot, Assistant Professor in the Department of Information Studies at the University of Maryland Baltimore County, and Charles R. McClure, Distinguished Professor in the School of Information Studies at Syracuse University, are co-principal investigators for the study. As of June 4, 1997, we have not received a completed survey from your library.

Your participation **IS CRITICAL** to the ability of the study to provide national statistics for public library Internet uses and costs. The study's sample uses a complex weighing scheme, drawn by the National Center for Education Statistics, to make national estimates. Each selected library (2,000 in all) represents numerous other public libraries with similar characteristics (e.g., region, population of legal service area, and rural/urban designation). These weights will require adjusting to compensate for libraries that elect not to participate, thus diminishing the accuracy of the national estimates. Please take the time to complete this second copy of the questionnaire even if your library is not currently connected to the Internet. **We will accept surveys through June 20, 1997**, even though the survey cover indicated a survey due date of May 23, 1997.

We would like to draw your attention to Section D, *Internet Service Cost Issues*, of the survey. This section asks each library to compute and/or estimate the costs associated with public library Internet-related services. We understand the difficulties associated with such calculations, particularly as many library technologies (e.g., workstations, telecommunications lines) serve other library functions than Internet services. **Such cost computations, however serve two very important purposes:**

(1) they will provide your library with cost data associated with Internet service provision; and

(2) they will provide a national public library-based cost estimate for Internet service provision that will enable us to inform policy makers as to the costs associated with public library Internet services.

Public libraries will need to identify the costs elements eligible for Universal Service discounts which range between 20% and 90%. Section D offers one way in which to begin to think about your library's Internet costs. Furthermore, the information in this survey is critical for supporting new Universal Service discount policies. As much as $2.25 billion in annual discount support for telecommunications services will be available to libraries and schools. But in order to have accurate information for the implementation and support of these discounts your help is needed. **The availability of accurate and valid telecommunications cost data on libraries is critical for policy makers and regulators as they begin to review the effects of the new Universal Service policy.** Without accurate baseline data, it will be difficult to show the efficacy of these discounts, potentially jeopardizing their availability in future years for all public libraries.

We appreciate your efforts to **complete and return the survey by June 20, 1997.** For a question regarding the completion of the survey, please contact John Bertot at (410) 455-3883 phone, (410) 455-1073 fax or e-mail <bertot@umbc.edu>.

Sincerely,

Jeanne Hurley Simon
NCLIS Chairperson

Mary Somerville
ALA President

Enclosure

APPENDIX C

FSCS PUBLIC LIBRARY UNIVERSE FILE ISSUES

According to the Federal-State Cooperative System (FSCS) Universe File, there are 8,921 library systems in the United States. Together, the FSCS state data coordinators and FSCS steering committees determine what constitutes a library system, and these definitions are included in the annual public library reports published by the National Center for Education Statistics (NCES). There are numerous definitions of a "library system" contained within the Universe File. The two that most pertain to this study are (NCES, 1997):

- **Administrative entity with a single direct service outlet** (essentially a single branch library system). An administrative entity that serves the public directly with one central library, books-by-mail only, or one bookmobile (p. 103).

- **Administrative entity with multiple direct service outlets where administrative offices are not separate** (essentially a multiple branch library system). An administrative entity that serves the public directly with two or more service outlets, including some combination of central librar(ies), branch(es), book-mobile(s), and/or books-by-mail only (p. 103).

There is some difficulty in determining the exact number of library systems by the Metropolitan Status codes (CC for Central City; NC for Metropolitan Area, but not within central city limits; and NO for Not in a Metropolitan Area), however . The primary reason for this difficulty is that there is some discrepancy in the interpretation of the Universe File's definition of a library system and, subsequently, a library system's central entity (administrative unit).

As shown in Figure 21 (p. 30), a vast majority of library systems have no branches--indeed only about 16.3% of public library systems do have branches. In general, many library systems operate on a one outlet-one library system basis, particularly for library systems that serve population of legal service areas of under 25,000. For the rest, however, there are some difficulties in determining a central entity. For example:

- Not all library systems designate a central entity (administrative unit). In such cases, a library system may have numerous outlets

(branches) of which none are considered a central entity.

- Some library systems designate multiple central entities (administrative units). In such cases, each system branch is in essence counted as an administrative unit.

- Not all library systems have buildings. Indeed, some of the library systems contained within the Universe File are simply bookmobiles.

Consider the following examples contained within the Universe File:

- 14 library systems have more than one central entity. That is, they appear in the Universe File multiple times with a Central Entity designation.

- Over 100 library systems do not appear to have central entities, but are designated as such. An example is that one library system only has 2 bookmobiles.

These library systems are counted in the overall number of library systems (8,921), but do not appear in any of the outlet files that have the central entity/metropolitan status codes. As such, there is no corresponding metropolitan status code for these libraries.

Because of the current status of the Universe File, therefore, it is not possible for the researchers to determine the exact number of public library systems by metropolitan status codes. Indeed, as shown in Figure 21 (p. 30), the metropolitan status code is unknown for 297 library systems.

APPENDIX D

FSCS DATA COORDINATORS AS OF JUNE 1997

Alabama	Fred Neighbors
Alaska	Mary Jennings
Arizona	Jan Elliott
Arkansas	Carolyn Ashcraft
California	Jay Cunningham
Colorado	Keith Curry Lance
Connecticut	Leon Shatkin
Delaware	Tom Dunlop
DC	Rita Thompson-Joyner
Florida	Lawrence Webster
Georgia	Diana Ray Tope
Hawaii	Betty Kingery
Idaho	Frank Nelson
Illinois	Stanley Adams
Indiana	Roberta Brooker
Iowa	Gerry Rowland
Kansas	Roy Bird
Kentucky	Jay Bank
Louisiana	Gretchen Fairbanks
Maine	Karl Beiser
Maryland	Susan Paznekas
Massachusetts	Dianne Carty
Michigan	Naomi Krefman
Minnesota	Janice Feye-Stukas
Mississippi	Lynn Shurden
Missouri	Jim Nelson
Montana	Diane Gunderson
Nebraska	Karen Ingish
Nevada	Diane Baker
New Hampshire	John Barrett
New Jersey	Robert Fortenbaugh
New Mexico	Scott Sheldon
New York	Carol Ann Desch
North Carolina	Barbara Akinwole
North Dakota	Carol Adams
Ohio	Darla Cottrill
Oklahoma	Jan Blakely
Oregon	Mary Ginnane
Pennsylvania	Carol Ann Colyer
Rhode Island	Ann Piascik
South Carolina	Libby Law
South Dakota	Dorothy Liegl
Tennessee	Jacci Herrick
Texas	Patty Davis
Utah	Sandi Long
Vermont	Marianne Kotch
Virginia	Gwen Goff
Washington	Jan Walsh
West Virginia	J.D. Waggoner
Wisconsin	Alan Zimmerman
Wyoming	Judy Yeo

ABOUT THE AUTHORS

John Carlo Bertot and Charles R. McClure and have worked together successfully on a number of research projects--most recently the *1997 Public Libraries and the Internet* study (the Executive Summary of this report appears on the ALA homepage <www.ala.org/oitp/>) and the *Evaluation of the Online at PA Libraries Project*. John Carlo Bertot is assistant professor at the Department of Information Systems, University of Maryland Baltimore County, and is faculty associate at the Maryland Institute for Policy Analysis and Research. He has published extensively on statewide and public library networking activities, and on topics related to federal, state, and county information policies and the use of information technology to deliver information resources and services.

At present, Bertot and McClure are the principal investigators for an evaluation study of the DelAWARE project, Delaware's online information resource. They are also the principal investigators for a project that is assessing the impact of networking on public libraries in Victoria, Australia.

Charles R. McClure is a distinguished professor of information studies at Syracuse University, School of Information Studies--one of only eight at the university to receive that title. He has published extensively on topics related to planning and evaluation of information and networked services, information policy, and libraries and the Internet. As co-principal investigator he just completed a one year study with Bertot funded by the Office of Common-wealth Libraries that resulted in the report *Evaluation of the Online at PA Libraries Project: Public Access to the Internet Through Public Libraries*; he is also Co-PI with Bertot on a study assessing Maryland's statewide network, Sailor, completed in September 1996.

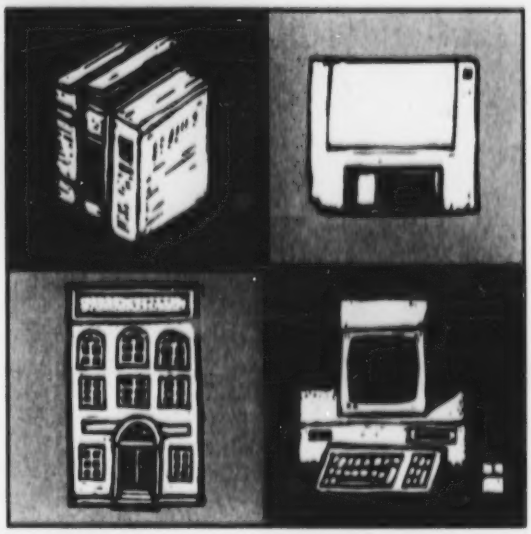
In 1995, McClure and Bertot completed a study funded by the National Science Foundation (NSF) that examined federal policies related to enhancing the role of public libraries in the networked environment. Also in 1995, as part of the NSF study with additional funding from the National Commission on Libraries and Information Science (NCLIS), McClure and Bertot produced *Internet Costs and Cost Models for Public Libraries*. McClure, with Bertot and Zweizig, completed a national survey of public libraries and their use of the Internet. This study and its final report, *Public Libraries and the Internet: Survey Findings and Key Issues*, was published in September 1996.

McClure has a proven track record of managing and successfully completing research projects funded by the U.S. Department of Education, the National Science Foundation, the U.S. Geological Survey, the Government Printing Office, and the NCLIS. His research has been recognized by awards from the American Society for Information Science, the American Library Association, and the Association for Library and Information Science educators. He was the founding editor of *Internet Research* and is a frequent speaker at professional associations and meetings.

Patricia Diamond Fletcher is assistant professor at the Department of Information Systems, University of Maryland Baltimore County, and is faculty associate at the Maryland Institute for Policy Analysis and Research. Her research is in the area of public sector information management. Fletcher is co-author of *Innovation and Information Management in City Government*, and author of *Managing Information Technology: Transforming County Governments in the 1990s*. Her current research is at the federal level of government, conducting a longitudinal study of information management policy implementation in conjunction with the Chief Information Officer's Council. Fletcher has served as a consultant to Bell Atlantic, EDS, Cnseiul SGE (Italy), Baltimore County, and other organizations. Fletcher is currently working on a book on Information Presentation.

121

The 1997 National Survey



Summary Results
November 1997

# of U.S. Public Libraries and the Internet

American Library Association Office for Information Technology Policy

A report on a survey conducted for the American Library Association by:
Dr. John Carlo Bertot, University of Maryland-Baltimore County
Dr. Charles R. McClure, Syracuse University
Dr. Patricia Diamond Fletcher, University of Maryland-Baltimore County

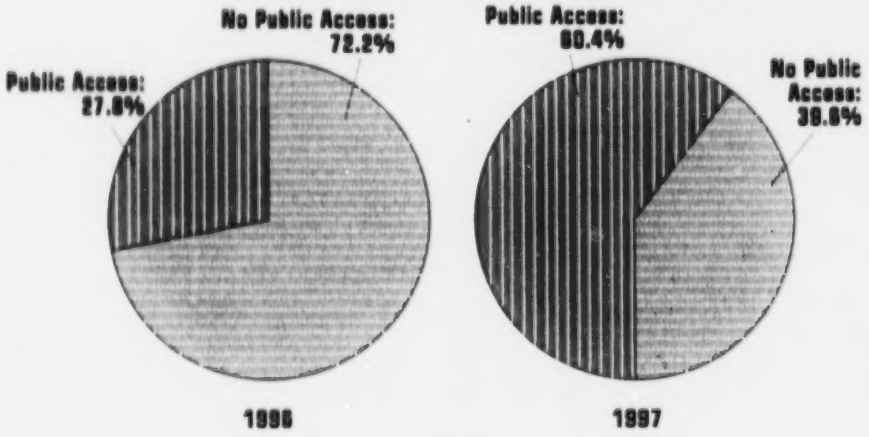
The survey was sponsored by the American Library Association Office for Information Technology Policy in cooperation with the U.S. National Commission on Libraries and Information Science and the American Library Association's Public Library Association and Office for Research and Statistics. Unless otherwise noted, information contained in this summary report reflects results from *The 1997 National Survey of U.S. Public Libraries and the Internet* conducted from March through May 1997.

Internet Access in U.S. Public Libraries Nationally

According to the National Center for Education Statistics, there were 8,921 library systems in 1994, the latest year for which these statistics are currently available. Of these library systems, 1,454 had branches. More than 73% of library systems with branches were located in areas that had a population of legal service area of 25,000 or more. Overall, the 8,921 library systems include 15,900 outlets consisting of branches and central facilities.

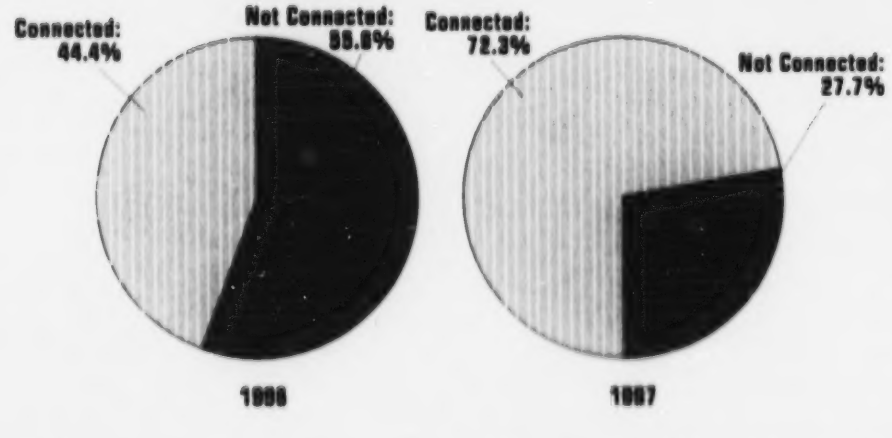
The 1997 survey provides information only on U.S. public library infrastructure and costs associated with Internet-related services and technology. A sample of 2,000 of the nation's 8,921 public library systems was selected for this survey. The sample was weighted to represent public libraries across various population service areas and central city, suburban, and rural locations. The survey achieved a response rate of 70.1% for a total of 1,402 responding library systems. The responses were reweighed to compensate for non-respondents. Thus, the data presented here are national estimates of public library Internet connectivity.

Percentage of Public Libraries Offering Access to the Internet



In 1997 nearly 3 out of 5 public library systems offer some type of Internet access directly to the public in at least 1 branch or the central facility.

Percentage of Public Libraries Connected to the Internet



Overall 3 out of 4 library systems are connected to the Internet. Of those that are connected 4 in 5 offer public access to the Internet.

Public libraries will spend an estimated $500 million in 1997 on information technology—$280 million on Internet access alone. Approximately $70 million—or nearly 25% of the $280 million for Internet access for public libraries—was provided from sources other than the library's operating budget.

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Hurdles for U.S. Public Libraries and the Internet

TOP FIVE	Factors Affecting Public Library Involvement with the Internet
1.	Telecommunications Fees
2.	Availability of Federal/State Funds
3.	Hardware Costs
4.	Digital Copyright Fees
5.	Availability of In-House Computer Expertise

The ***cost of telecommunications fees,*** such as phone line long distance charges and leased line costs for data communications, was the number one factor affecting public library involvement with the Internet.

Availability of federal and state funds was the second biggest factor affecting public library involvement with the Internet. This includes programs like the Library Services and Technology Act or monies appropriated by states for public library infrastructure projects. OPLIN, the Ohio Public Library Information Network; SAILOR, Maryland's Online Public Information Network and SLED, the State Library Electronic Doorway in Alaska, show the importance of federal and state funding for libraries.

The other factors affecting public library involvement with the Internet include:

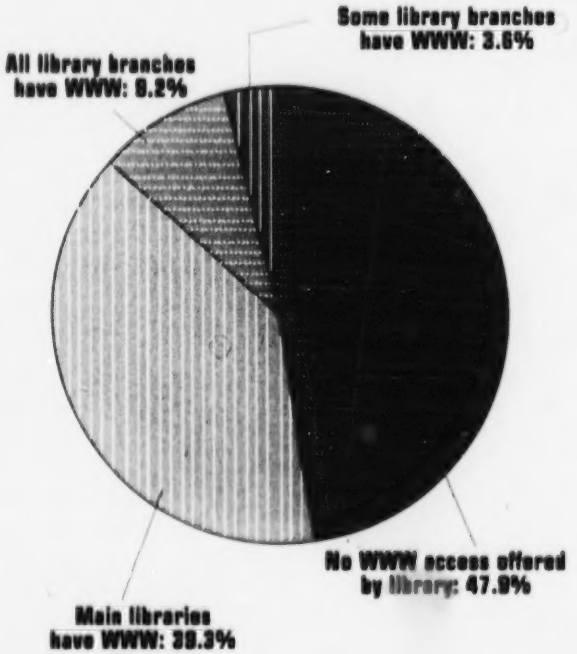
Hardware costs, such as the costs for workstations, terminals, and system servers.

Digital copyright fees, such as licensing fees for online databases.

Availability of in-house computer technical expertise, such as telecommunications specialists, computer operators and Web designers.

Public Access to the World Wide Web (Graphical) in Library Branches

Graphical access to the World Wide Web is the most widely offered service, with availability in at least 1 outlet in over half of all public library systems. However, while nearly 2 out of 5 public libraries have Web access in their central or main facility, ***fewer than 1 in 7 offer World Wide Web access in all or some of their branches.***(1)


Some library branches have WWW: 3.6%
All library branches have WWW: 9.2%
No WWW access offered by library: 47.9%
Main libraries have WWW: 39.3%

(1) According to the National Center for Education Statistics, there were 8,921 library systems in 1994, the latest year for which these statistics are currently available. Of these library systems, 1,454 had branches. More than 73% of library systems with branches were located in areas that had a population of legal service area of 25,000 or more.

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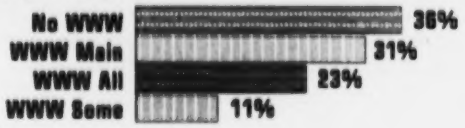
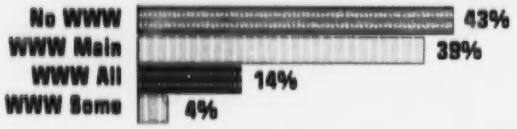
Internet Access in U.S. Public Libraries Regionally

Central City Access

Access to the World Wide Web in public library branches in central city, suburban and rural areas is mixed. ***In central city areas, about 1 in 3 public library systems offer access in some or all of their outlets*** while the same number offer no Web access.



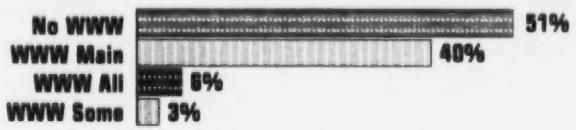
Suburban Access



In suburban areas close to 1 in 5 public library systems offer Web access in some or all of their outlets, while 2 in 5 offer no access.

Rural Access

In rural areas the difference is even greater, with less than 1 in 10 of public library systems offering Web access in some or all of their outlets, while over half of rural public libraries are not offering any Web access.



THE IMPORTANCE OF CONNECTING LIBRARIES ...

In Georgia an orchard grower finds weather conditions, fruit and vegetable prices, and new markets on the Internet by accessing Peachnet through the local public library.

— Alan L. Kaye, director, Roddenberry Memorial Library, Cairo, Georgia, April 1996.

Connectivity

Most common type of dial-up connections

REGION	TYPE	PERCENTAGE
Central City	28.8k	51.6%
Suburban	28.8k	53.6%
Rural	28.8k	46.4%

Most common type of leased line connections

REGION	TYPE	PERCENTAGE
Central City	56k / T1	37.6% / 38.7%
Suburban	56k	50.3%
Rural	56k	67.9%

In terms of types of ***connectivity,*** for ***dial-up*** use, the most commonly offered type of connection supported in central city, suburban, and rural areas is 28.8 kpbs. For ***leased line*** connections, central city libraries were more likely to be using either a 56 kbps or T1 connection. For suburban and rural libraries, 56 kbps connections were used by about half or more of the libraries surveyed in each category.

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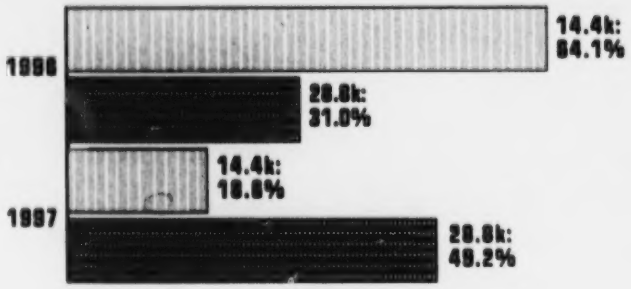
Infrastructure of U.S. Public Libraries

Dial-Up Connectivity

In their expanding role as both a bridge and a gateway to multimedia information, libraries face added demands on their technical infrastructure. In 1996, more than 3 out of 4 of basic library dial-up connections were at 14.4 kbps or less. By 1997, ***28.8 kbps represented the largest segment of dial-up service in libraries (nearly 1 out of 2)*** and several libraries were also offering 33.6 kbps and even advanced ISDN connectivity.

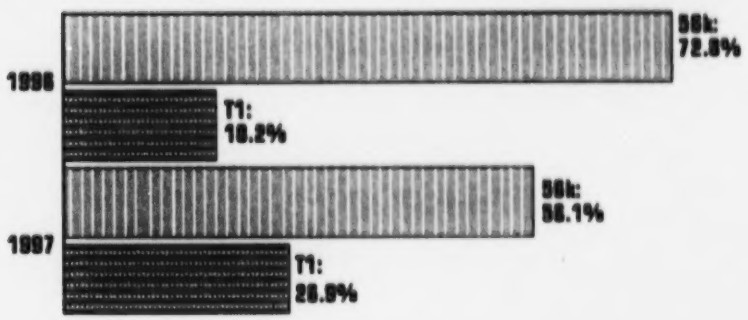


THE IMPORTANCE OF CONNECTING LIBRARIES...

A homeless man became so skilled in using Seattle Public Library's online network that he was asked to interview with a Los Angeles company which hired him as a contract programmer and arranged for his housing.

– Kickstart Initiative. National Telecommunications and Information Administration, United States Department of Commerce. 1995, p. 54.

Leased Line Connectivity



In 1996, nearly 3 out of 4 connected libraries had 56 kbps leased lines and only about 1 in 5 had a T1 line. In 1997 the number of libraries having a 56 kbps line decreased while ***more than 1 in 4 libraries had faster T1 lines.***

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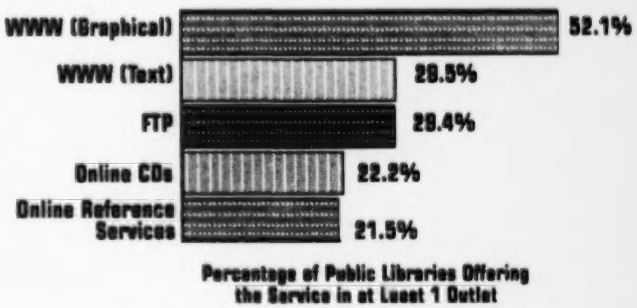
Services Most Offered By Public Libraries

Libraries are striving to provide access to emerging Internet services. ***More than half provide the public with graphical access to the World Wide Web*** in at least one of their outlets. Nearly 1 in 3 offer text based access to the World Wide Web.

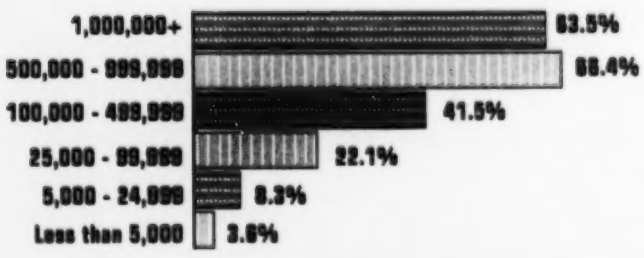


THE IMPORTANCE OF CONNECTING LIBRARIES ...

In New York City Public Library's Science, Industry and Business Library, an entrepreneur used an online version of the Thomas Register to locate manufacturers for hard-to-make gift wares.

— Field, Ann. Biblio-Tech, Inc. Tech 1997 No. 3. p. 21.

U.S. Public Libraries Hosting Their Own Web Sites



In addition to providing public access to the Web and other Internet services, more and more libraries are acting as repositories of local Web-based information. Nearly 900, or about ***10% of all public libraries have their own Web sites*** — up from 1.2% in 1996. Libraries in large cities are more likely to have their own Web site than libraries in smaller towns.

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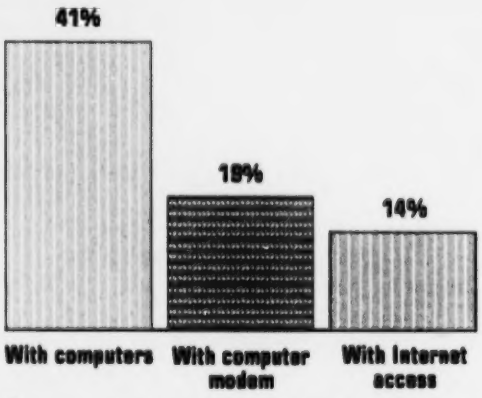
Household Access to the Internet 1996 (1)

Libraries can provide a valuable service as access points to those households that do not have Internet access. *The Wall Street Journal* reported that only 41% of households own a personal computer, and of those only about 1 in 3 have Internet access. ***Overall only 1 in 7 of all households in the United States have Internet access.***



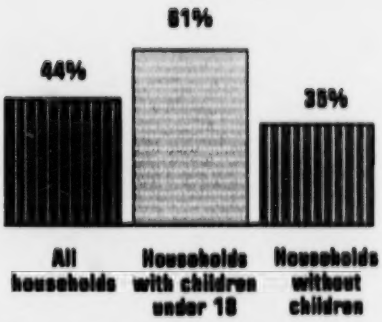
(1) Source: *The Wall Street Journal*, "Bringing It Home." June 16, 1997, pp. R1, R4.

THE IMPORTANCE OF CONNECTING LIBRARIES...

At-risk children ages nine to 14 participate in an Internet skills project through the Hollins-Payson branch of the Enoch Pratt Free Library in Baltimore, Md. The "Whole New World" program allows children to use electronic information and e-mail to which they might not otherwise have access.

— Mondowney, JoAnn G. "Licensed to Learn," School Library Journal, January 1996, pp. 32-34

U.S. Public Library Visits by Household 1996 (2)



(2) Source: National Center for Education Statistics. Statistics in Brief. March 1997. Use of Public Library Services by Household in the United States, 1996.

According to the National Center for Education Statistics, libraries are visited by a large segment of the U.S. population. ***About 44% of all households visited a public library within the last month.*** Among households with children under 18 years of age, 61% had visited a library within the last month.

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About the Survey

The 1997 National Survey of U.S.Public Libraries and the Internet was conducted from March through May 1997 by Dr. John Carlo Bertot, assistant professor at the Department of Information Systems, University of Maryland-Baltimore County; Dr. Charles McClure, distinguished professor at the School of Information Studies, Syracuse University and Dr. Patricia Diamond Fletcher, faculty associate at the Department of Information Systems, University of Maryland-Baltimore County.

The 1997 study builds and expands upon areas of public library Internet-related data as reported in the 1994 and 1996 studies sponsored by the U.S. National Commission on Libraries and Information Science. It only provides information on U.S. public library infrastructure and costs associated with Internet-related services and technology.

A sample of 2,000 of the nation's 8,921 public libraries was selected for this survey. The sample was weighted to represent public library systems across various population service areas and central city, suburban, and rural locations. The survey achieved a response rate of 70.1%

Limited copies of *The 1997 National Survey of U.S. Public Libraries and the Internet* are available at no charge from the address below, or online at www.ala.org/oitp/research/plcon97sum.

Inquiries concerning the information presented here should be directed to J. Andrew Magpantay, Director, Office for Information Technology Policy, American Library Association, 1301 Pennsylvania Ave., N.W., Suite 403, Washington, D.C. 20004-1701; phone: 202/628-8421; fax: 202/628-8424; e-mail: oitp@alawash.org.

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How ALA is Helping to Bring Access to the Information Superhighway to All Americans
www.ala.org/oitp/programs.html

The Librarian's Guide to Cyberspace for Parents and Kids ***www.ala.org/parentspage/greatsites***

An up-to-date online guide published by the American Library Association to help parents and kids navigate the Internet together. Includes award-winning booklists and other helpful information. Call 800-545-2433 extension 5044/5041 for a free brochure.

Microsoft/ALA Libraries Online! ***www.librariesonline.org***

Libraries Online! was a two-year initiative of Microsoft Corporation and the American Library Association to research and develop innovative approaches for extending information technologies to understand communities. Currently 41 library systems in the U.S. and in Canada have received $10.5 million in financial and technical assistance and software. The success of Libraries Online! spurred the establishment of the Gates Library Foundation (www.glf.org) with a $200 million contribution from Bill and Melinda Gates and an equal software contribution from Microsoft.

ICONnect/KidsConnect ***www.ala.org/ICONN***

ICONnect is a technology initiative of the American Association of School Librarians, a division of the American Library Association, and is designed to help students develop the information and visual literacy skills they need to be productive citizens as well as provide training for school library media specialists and teachers to effectively navigate the Internet and to develop and use meaningful curriculum connections with teachers and students. The goal of KidsConnect is to help kids access and use information available on the Internet effectively and efficiently. Library media specialists from throughout the country are collaborating on KidsConnect to provide direct assistance to any student who needs help.

MCI LibraryLINK ***www.librarylink.com***

MCI LibraryLINK is a three-year public-private community partnership between MCI and the American Library Association to integrate communications technology to enhance the link between local libraries, the communities they serve, and the vast resources of the information infrastructure. Eighty-seven libraries have benefitted from the 27 individual grants awarded to public libraries through MCI LibraryLINK from 1995 through 1998.

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